PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

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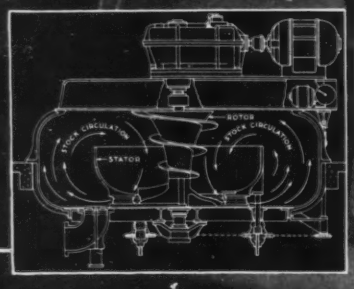

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Entered as second class matter at the Post Office at East Stroudsburg, Pa., under the Act of Congress of March 3, 1879. Published every Thursday by the Lockwood Trade Journal Co., at 34 N. Crystal St., East Stroudsburg, Pa. Executive and Editorial office: 15 W. 47th St., New York, N. Y.
Domestic subscription U. S. and possessions, $4.00 per year.

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Published Every Thursday by the
LOCKWOOD TRADE JOURNAL CO., Inc.

Executive and Editorial Offices: 15 West 47th Street, N. Y. C.
Western Rep.—H. K. Vinton, 123 W. Madison St., Chicago, Ill.

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The PAPER TRADE JOURNAL is indexed in Industrial Arts Index

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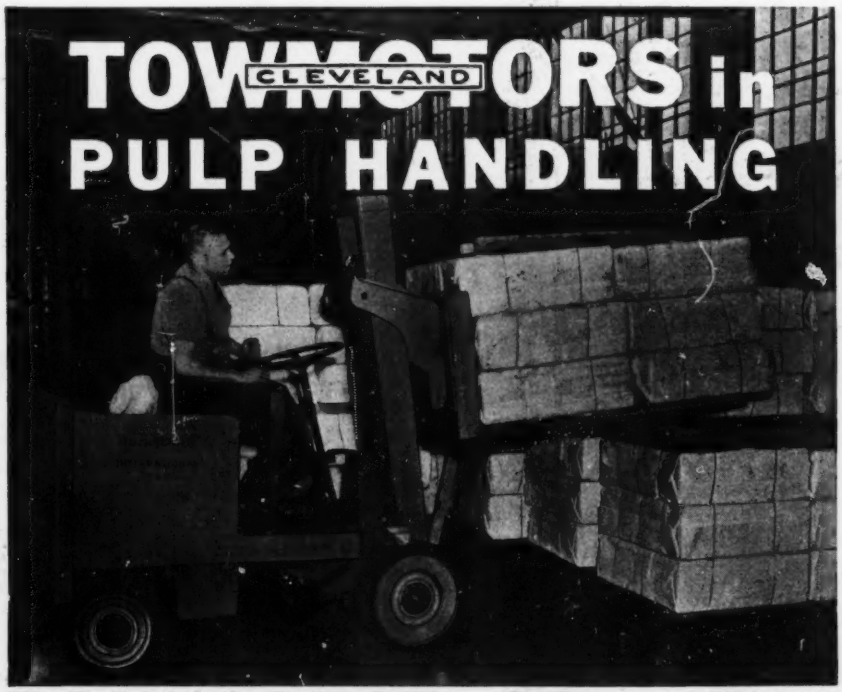

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PAPER
PAPER
Established Feb. 17, 1899
Consolidated Nov. 16, 1899
with PAPER TRADE JOURNAL.
Vol. CV, No. 27 Thursday, December 30, 1937
Established Sept. 21, 1910
Consolidated Feb. 19, 1925
with PAPER TRADE JOURNAL.

Tariff Commission Reports On Wood Pulp

Domestic Production of Wood Pulp Is Greater Than That of Any Other Country, Being One-Fifth of World's Total — United States Imports of All Varieties of Wood Pulp for 1936 Amounted To About 2,250,000 Tons.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 29, 1937.—The United States Tariff Commission in its annual report just made public makes a summary of the work which it did during the past year. Commenting on the wood pulp and pulpwood investigation the Commission says:

A report on wood pulp and pulpwood was completed in response to Senate Resolutions 365 of the 72d Congress and 200 of the 74th Congress. For this report, the commission collected from official sources extensive data on the wood pulp industry and trade of the United States and of foreign countries. In addition, it obtained from pulp producing concerns in all sections of the country data regarding output, sales, transportation, costs of production, and other matters. Importers and paper manufacturers and other pulp using industries were also drawn upon for material needed in a study of the industry.

The United States production of wood pulp is one-fifth of the world total and greater than that of any other country. Canada, Sweden, Germany, Finland, and Norway, in the order named, are the other most important producing countries.

Although there was a substantial fall in world production of wood pulp during the depression, the upward trend in post-war years has been marked. The output in the United States in 1936, over 5½ million tons, was about one-sixth more than in 1929, and there were comparable percentage increases in the production of other countries.

The paper industry of the United States uses, in addition to the bulk of the domestic pulp output, large amounts of foreign wood pulp; in fact, the United States is the largest market for the wood pulp entering international trade; in 1936 its imports amounted to about 2¼ million tons.

Table I compares domestic production, imports, and exports of each of the main kinds of wood pulp in 1935, the latest year for which the value figures on domestic production are available. The quantity figures for 1936 show no great change in ratios as compared with 1935. The approximate quantities of the domestic output not converted into paper or board by the producing concerns, but sold as pulp, are also shown. Imports of pulp compete more directly with pulp sold by domestic mills than with that used by the producing concerns in their own paper manufacture.

TABLE I.—WOOD PULP: UNITED STATES PRODUCTION, IMPORTS, AND EXPORTS IN 1935

(Quantities in thousands of tons of 2,000 pounds; values in thousands of dollars)

	Total	Sulphite	Sulphate	Ground wood	Soda, semi-chemical, and screenings
Production					
Quantity	4,944	1,595	1,468	1,356	526
Value	151,003	71,416	36,009	24,972	18,606
Imports					
Quantity	1,933	1,123	611	190	9
Value	70,735	45,960	21,087	3,277	410
Exports					
Quantity	171	170	None	None	2
Value	8,633	8,528	.....	.....	105
Apparent consumption					
Quantity	6,706	2,548	2,079	1,546	533
Value	213,105	108,848	57,096	28,249	18,911
Ratio of imports to apparent consumption by quantity (per cent)	28.8	44.1	29.4	12.3	1.7
Approximate sales by domestic mills including exports —Quantity	673	556	15	18	84

Imports of wood pulp in 1935 accounted for about 29 per cent of consumption, the proportion being highest in the case of sulphite pulp.

Exports of wood pulp, chiefly from the Pacific coast mills, have increased greatly in recent years but are still small in relation to domestic production or imports; in 1935 and 1936 they amounted to less than 4 percent of production. Most of the exports are of sulphite pulp. Japan, taking the bulk of the exports from the West Coast, has become by far the most important export market.

Notwithstanding the large domestic production and imports of wood pulp for use in the domestic paper industry, the United States is a far larger consumer than producer of paper. In 1936 imports of newsprint, the only kind of paper imported in great volume, amounts to about 2¾ million tons.

If imports in the form of pulp and in the further advanced form of newsprint paper are taken together, almost as much wood pulp has been imported in recent years as has been produced in this country. In addition to the imports of pulp and paper, 10 to 15 percent of the domestic production of wood pulp has been made from imported pulpwood.

(Continued on page 27)

Canada Moderately Optimistic on Newsprint

Production of Newsprint Continues On Higher Level Than Last Year But Affect of New $50 Price Uncertain—Exports for November Higher — Germans At Anticosti Island — Progress In Lumber — Other News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., December 27, 1937.—As the year comes to a close what may be termed a feeling of restrained optimism prevails in the pulp and paper industry in Canada—optimism because the progress towards recovery has been substantial during the past 12 months—restraint because the outlook is by no means clear. The general feeling may perhaps best be summed up in words used by the Bank of Montreal in its current business letter, which says in regard to the general business situation that "There is undoubtedly evidence of some recession in business in certain sections of the country but in none of them is it serious, and hopes are cherished that Canada may not suffer serious repercussions from conditions at present prevailing in the United States."

Production of newsprint has continued up to the present on a substantially higher basis than in the comparable period of last year, but whether or not it will so continue in the new year is a question that has yet to be determined. The new price level of $50 per ton will go into effect as from January 1st, and no one can say how this combined with the present disturbed conditions in the United States, will affect consumption. As far as Canadian publishers are concerned, they are studying economies in the use of newsprint and many papers are raising their subscription rates.

November Export Values Up

A report just released by the Dominion Bureau of Statistics shows that both in volume and in value Canada's November exports of newsprint were well ahead of those in November last year. The exports amounted to 6,312,840 cwt., valued at $11,572,240, compared with 5,916,653 cwt., valued at $10,340,246 in November 1936, the Dominion Bureau of Statistics reported today.

The United States took 5,104,613 cwt., the United Kingdom 304,967, Argentina 270,041, New Zealand 144,816 and Australia 126,534.

Total for the first eight months of the fiscal year was 47,381,513 cwt. valued at $87,293,623, as compared with 41,626,601 valued at $72,300,954 during the same period a year ago.

The United Kingdom and the United States took most of Canada's November export of planks and boards which was valued at $3,739,996 compared with $3,868,478 in November, 1936, the Dominion Bureau also reported.

Of the total export the United Kingdom took $2,119,676 worth and the United States $976,917.

Germans Still at Anticosti Island

Agitation continues, especially in the city of Quebec, over the activities of a German delegation in connection with the proposed sale to Germans of pulpwood rights on Anticosti Island, of which the Consolidated Paper Corporation is the owner. The ten German engineers who a short time ago went on an inspection trip to Anticosti Island are still there engaged in surveying the timber resources of the island, and are not expected to return to Montreal until the New Year.

They will probably fly from the island by a specially chartered Skylines Express 'plane.

During the last two weeks Dr. H. Woollert, the leader of the German delegation to Canada, with other associates has been inspecting various timber and pulp-producing properties in Quebec.

The German pulp industry is looking for new sources of supply since Finnish sources have been very much limited by a new forest-conservation policy.

Progress in Lumber Trade

The Montreal Lumber Association and the Montreal Wholesale Lumber Dealers' Association have had their annual meetings in Montreal during the past week, and both have reported improvement in business during the past year. H. P. Wood, the president of the latter, said exports of lumber from Eastern Canada continued at a high level all year despite a very rapid rise in ocean freight to the United Kingdom, Mr. Wood said. The freight rates in question were practically doubled in the year and it was likely that they would result in some reduction of British buying in 1938. Relative to conditions in Great Britain, he said that industrial production continues at a high level.

Conditions in American Market

Regarding the American market, Mr. Wood said that conditions there were excellent and large orders for lumber were placed in Canada during the first nine months of the year, much of this trade being due to forward buying in anticipation of inflation in all commodity prices. It now appeared that production was at least equal to present consumption.

Repairs and industrial uses had largely accounted for the increased consumption of lumber in Canada.

There was uncertainty, however, at present, as to what the coming year held in store for the trade. Higher taxes, increased costs of supplies and a multiciplicity of Government regulations combined to make it appear that the producer can only afford to operate if high prices for lumber are maintained, he said.

One immediate result of this element of uncertainty, he continued, would probably be a reduction of 50 per cent in the production of lumber in Eastern Canada in 1938.

Bathurst Company's Expansion

President R. L. Weldon, of the Bathurst Power and Paper Company, in a letter to shareholders accompanying dividend cheques, comments on the fact that this is the first payment since that of March 15, 1929, and says that it reflects a substantial improvement in the earnings of the company during the cur-

rent year. In regard to recent developments in the company's affairs, the president writes as follows:

"The construction of the new steam and power plant referred to in our last annual report is completed and the plant is now operating. The company is thus assured of an uninterrupted and efficient supply of power at its plant at Bathurst, N. B.

The diversified products of the company consisting of kraft liner board, kraft corrugating, newsprint paper, folding and non-folding box boards and unbleached sulphite pulp are now being shipped to all parts of the world. The capacity of the plant at Bathurst for the manufacture of these products for sale is now over 100,000 tons per annum.

Government Paper Bids and Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 29, 1937.—The National Pulp and Paper Company has been awarded the contract for furnishing the Government Printing Office with 120,000 pounds of newsprint paper in 24 inch and 36 inch rolls at 2.5 cents per pound, and the Equitable Paper Bag Company will furnish 48,000 pounds of No. 2 kraft wrapping paper, 36 x 48 at 4.23 cents less 2 per cent. Bids for these items were received on December 13.

The R. P. Andrews Paper Company will furnish 36,000 pounds of hard rolled binder's board, 22 x 28 at 5.2 cents per pound, bids for which were received on December 6. The same firm will also furnish 6,000 pounds (4,800 sheets) of best quality hard rolled binder's board at 5.2 cents per pound, bids for which were received on December 3.

Other paper awards at the Printing Office include 400,000 pounds of newsprint paper in 48 inch rolls to the National Pulp and Paper Company at 2.5 cents; 16,700 pounds of monotype keyboard paper to the Lanston Monotype Machine Company, 10 cents; and 28,000 pounds of super purified wood tag board, 22½ x 28½ at 7 cents per pound to Reese & Reese Inc.

The Printing Office has received the following bids for 26,675 pounds (275,000 sheets) of light weight M. F. book paper; Mathers-Lamm Paper Company, 14 cents; Stanford Paper Company, 14.2 cents; and Whitaker Paper Company, 14.27 cents.

For 1,000 pounds of red stereotype molding paper; Cauthorne Paper Company, 14 cents; Russell Products Company, 15 cents.

For 18,000 pounds (8,300 sheets) of binder's board; R. P. Andrews Paper Company, 5.2 cents; and Barton, Duer & Koch Paper Company, 5.2 cents.

TAPPI Ohio Section to Meet

The Ohio Section of the Technical Association of the Pulp and Paper Industry will meet at the Anthony Wayne Hotel, Hamilton, Ohio, January 8, 1938. Clarke Marion, vice president of the Champion Paper and Fibre Company will talk on "Management," Henry Keller, engineer of the Link-Belt Company will discuss "PIV Gears", and R. A. Diehm will talk on "The Potentialities of Enzymes in the Paper Industry."

Wheelwright Paper Declares Final

The Wheelwright Paper Company has declared the final dividend, making the total 93½ per cent.

Michigan Superintendents Meet

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., December 27, 1937.—The December meeting of the Michigan Division of the American Pulp and Paper Mill Superintendents Association was held Thursday evening, December 16, at the Park American Hotel. It was, as usual, a dinner meeting with fifty-three present. The committee on arrangements had met with two disappointments in their guest speakers. The original speaker was to be Dr. Schwalbe, of Dill & Collins Inc., Philadelphia, but due to a shift in the personnel from Philadelphia to the Chillicothe Division of the Mead Corporation, of which Dill & Collins is a subsidiary, Dr. Schwalbe was unable to be present. Then Dr. C. B. Albert, of the Edgar Brothers Company, was substituted, but he, too, was detained in the east, so the paper to be presented was substituted with a discussion of all types of filling and coating pigments. Olin W. Callighan, technical service representative of the Edgar Brothers Company, led the discussion.

Among those at the meeting, the following were noted:—Dan Stacy, President; A. B. Perlick, Secretary; Joe Dennoney, H. J. Johnston, M. C. Mulder, J. Widmeyer, Allied Paper Mills; Wm. Barnhart, American Boxboard Company; J. R. Verdon, American Cyanamid Corporation; R. M. Radsch, Appleton Machine Company; O. F. Fischer, A. B. Milham, R. A. Olson, Bryant Paper Company; W. B. Hadley, Detroit Paper Products Corporation; L. H. Breyfogle, Draper Brothers Company; A. W. Callighan, Edgar Brothers; M. F. Flotou, F. L. Zellers, French Paper Company; E. M. Cowling, Hawthorne Paper Company; W. H. Stewert, J. Willard Heisley Company; Barney A. Yule, F. C. Huyck & Sons; Frank Deuner, P. F. Deuner, M. Redmond, Kalamazoo Paper Company; L. H. LaLiberte, Frank Libby, R. B. Stewart, Kalamazoo Vegetable Parchment Company; Wm. H. Astle, Roy Barton, Paul de Guchery, G. C. Schmid, Robert Van Maur, Michigan Paper Company; Jake Parent, Noble & Wood Company; Harry Starr, Price & Pierce; A. W. Cole, Heinie Minchorf, Rex Paper Company R. W. Holden, Stowe-Woodward Company; A. L. Sherwood, Arnold Weller, Sutherland Paper Company; Lawrence Lynd, Vanderbilt Company; G. H. Rentrop, Westinghouse Electric and Manufacturing Company; and E. J. Moran.

German Paper Exports Higher

German exports of paper and paper manufactures during the first 9 months of 1937 were uniformly higher than during the corresponding period last year. The largest single item in this group was printing paper, shipments of which reached 159,403 metric tons as against 121,549 tons last year, an increase of 31 percent. Next to printing paper in importance were boards and wrapping papers, shipments of the former totaling 80,933 tons and of the latter 62,592 tons during the first 9 months of the current year. Both of these figures represent an increase of 17 percent over the corresponding 9 months in 1936. The remaining shipments consisted largely of writing and fancy coated papers. Exports of writing paper, totaling 18,855 tons, were more than double, and exports of coated papers, totaling 27,371 tons, were 16 percent above the 1936 shipments.

Newsprint Mills Meeting Production Problem

Canadian Producers Facing Trying Period In the Next Few Months — Hinde & Dauch Doing Well — Abitibi Reports Earnings and Shipments Up — Secretary of Canadian Paper Box Ass'n Talks on Conditions

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., December 27, 1937.—Operations of the Canadian newsprint industry for the first quarter of 1938 may drop to between 50 per cent and 60 per cent of rated capacity, depending upon consumption of newsprint in the United States during the period. This forecast is on the basis that consumption will remain unchanged and that surplus stocks will be absorbed in the three months period. With no drop in consumption, and allowing for liquidation of surplus stocks, Canadian newsprint manufacturers' net earnings in 1938, available for depreciation, interest charges, etc., should be eight million dollars greater than for 1937. With the expected drop in consumption of newsprint in the United States now at anywhere from 5 per cent to 10 per cent, earnings of Canadian producers may not be any greater in 1938 than in 1937, but they should not drop much below 1937, with the qualification that earning power will be dependent largely upon the outcome of the last nine months of the year. Unquestionably the newsprint industry faces a difficult and trying period over the next three months and possibly even longer. The most encouraging factor is the manner in which the companies are facing the problem of over-production and declining consumption, strengthening the belief that the industry will come through next year in good shape.

Hinde & Dauch Are Doing Well

Accompanying dividend checks is a letter to shareholders of Hinde & Dauch Paper Company, by General Manager Winchell, who states that the company has gone through another year in which much progress has been made and that he is sure shareholders will be satisfied with results to be reported to them shortly. "We will start 1938", he says, "with our new boiler plant at Toronto, as well as several of the new units auxiliary to the actual making of paper at both Toronto and Trenton, in operation. These new features should not only improve our production capacity and quality but should effect worthwhile economies as well. While complete in themselves, they are really but another step to further improvement possibilities, which, undoubtedly, your directors will see fit to authorize as promptly as it seems expedient to do so. Regardless of the present tendency towards a recession of business, we feel strongly that the year 1938 will prove to be as good a one for business as was the year 1937."

Abitibi Shipments Up

From the headquarters of the company in Toronto it is learned that earnings of the Abititi Power & Paper Company for November, 1937, prior to charges for depreciation and bond interest amounted to $411,528, as compared on a similar basis with $431,931 for the month of October, 1937, and $200,390 for the month of November, 1936.

Shipments of newsprint in the month of November, 1937, amounted to 47,153 tons, as compared with 46,677 tons in October, 1937 and 36,639 tons in November, 1936. Present indications are that shipments during December, 1937, will not likely be reduced to any important degree, but that customers of Abitibi will require all newsprint to which they are entitled under existing contract at the present market price. With increase in such market price on January 1, 1938, excess stocks of newsprint now in the hands of customers, and the recession in business in the United States, expectation is that there will be a serious decline in shipments of newsprint by Abitibi and other big Canadian newsprint mills during the earlier months of 1938 and until conditions adjust themselves.

Shipments of Bleached Sulphite

Shipments of bleached sulphite by Abitibi amounted to 3,464 tons in the month of November, 1937, as compared with 4,009 in November 1936. Indications are that Abitibi's shipments of bleached sulphite pulp in December, 1937, will not likely exceed 2,200 tons, and that with the recession in business in the United States and excess inventories in the hands of customers, orders for and shipments of bleached sulphite pulp by Abitibi will likely continue at a reduced rate until conditions become adjusted.

Canadian Paper Box Market

Commenting upon the condition of affairs in the Canadian paper box industry, C. V. Hodder of Toronto, secretary of the Canadian Paper Box Manufacturers' Association, reverted to the sudden change last spring from a buyer's to a seller's market and adds: "There are many surprising things in looking back on this period. Despite increased demand there was very little price change. The old disease of storage reared its ugly head once more and we do not think it exaggeration to say that when the slow-up time came many manufacturers had finished goods on their hands in greater proportion than since the days of 1929. We believe it also is a fact most of these self same manufacturers have larger inventories of raw material than they have had for many years past. It would be unfair to suggest that there was no reason for not increasing price, for it is a remarkable fact that during the past few years, despite a more or less limited demand, there have been more and more companies arising, throughout Eastern Canada particularly, to share in the business available. This is not only true of folding but is equally true of set-up. There was, therefore, a natural feeling of fear on the part of an individual who contemplated a raise in price as to what his competitor would do, the latter being, to a large extent, an unknown quantity. This condition of newcomers is not only something to be expected but it is something we will have to continue to expect and face."

Improved Demand Seen in Low Inventories

Little Business On Hand In Chicago At Christmas But Outlook for New Year More Optimistic — Certificates of Resale Puzzle To Trade — New Illinois Unemployment Insurance Law — Other Late Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., December 27, 1937.—With proper Christmas spirit, the paper industry tapered off the holiday session with little business on hand but with increasingly improved outlook for the New Year. The minor psychological improvements which followed the independent action of the Federal Congress last week is reported to have already engendered a slight lessening of the order jam. For a number of reasons, local paper executives feel that after the inventory period business will improve. From all grades comes the news of low inventories which are a necessary basis for improvement.

Meanwhile, local markets were at a comparative standstill. Newsprint offices continued to report a last minute influx of orders in advance of the reported price increase after the first of the year. Groundwoods were in fair demand even during the holiday period with mills running at a reported 70 to 80 per cent. Fine papers were quiet though steady. Sulphites were designated as firm, though orders were slow and in comparatively small quantities. Books and covers found some slight increase in business as a few concerns expanded their 1938 programs in view of signs of improved psychology. Kraft papers were firm. The board market showed little change in its recession covering the last few months of the year. Waste papers were at a standstill as mills refused to enter into any buying negotiations.

Listing of Certificates of Resale Puzzling Trade

Chicago and Illinois merchants who have been considerably perplexed by a ruling of the Department of Finance requiring a monthly listing of certificates of resale under the Retailers Occupational Tax. The ruling required manufacturers, wholesalers and retailers in the paper industry and other industries to make monthly listings—later amended to be based only on September listings with subsequent names of new accounts added. It meant a great deal of clerical work and found scores of paper wholesalers, in particular, contacting retail accounts asking for blanket certificates of resale in which the retail accounts agree that the product purchased is for resale purposes.

During the past month protests filed with the Department against the procedure of listing which precipitated the wave of requests for certificates, seem to have gotten results. Reports are current that the Department of Finance shortly will rescind the above mentioned rule, thus placing the rules back on the former basis and making the certificates of resale of primary importance only as a means of showing proof of such transactions.

To clarify the opinions of Illinois paper jobbers, it is well to bear in mind that the concern selling wrapping paper, twine and the like to retail stores who package their merchandise with such materials and deliver the merchandise, is making a sale for resale and that the retailer can quite properly sign a certificate of resale if the packaging materials are transferred ultimately to customers of the retail store.

Unemployment Insurance Problem in New Law

Illinois employers are now faced with the interesting problem of wondering just what type of regulations governing the Illinois unemployment insurance act are to be handed out to them during the next two weeks. The Illinois law, one of the final State laws to be enacted, leaves open the problem of whether or not the State's employers—including, of course, the paper industry—are to report their payroll position on a monthly, quarterly or "when requested" basis. The chief desire of the majority of the organizations representing employers is to have the most simple and workable plan of reporting possible. At present efforts are being concentrated on a system whereby the employer is properly defined as a "stable employer" and provides factual information only when desired by the Unemployment Insurance Commissioner. Under proposals presented to the Commissioner, business firms would have the alternative of reporting quarterly if desired or of defining themselves under the requirements of a stable employer and thus saving the costliness of a detailed report each month or each quarter.

Paper Industry Represented on Committees

The Chicago Association of Commerce has recently announced the appointment of several special committees composed of well known representatives of the paper industry. The Box Board Products division is chairmanned by E. P. Lannan, Central Fibre Products Company, Inc., with other members including R. H. Ritchie, W. C. Ritchie & Company; J. P. Brunt, Brunt & Company and George J. Kroeck, Kroeck Paper Box Company. The Paper and Envelopes Division Chairman is J. D. Swigart, Swigart Paper Company. Other members are E. N. Whitaker, American Paper Goods Company; James M. Abell, J. W. Butler Paper Company; Joseph Regenstein, Transo Envelope Company; H. A. Swigert, Chicago Neostyle Envelope Company and A. B. Tucker, Parker, Thomas & Tucker Paper Company.

Give Annual Duck Dinner

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., December 27, 1937.—The annual duck dinner, an event long sponsored by C. B. "Baldy" Smith, of the Huron Milling Company, and Roy W. Holden, of the Stowe-Woodward Company, was held in the recreation room of the Park American Hotel, on Saturday evening, December 18. As each dinner seems to surpass the previous one, the most that can be said is that this occasion was no exception. The dinner, the music, the entertainment were all superb and fortunate indeed are those whose names are on the invitation list. The number is limited to forty.

Mills Distribute Gifts, Bonuses To Workers

Employes of Nearly All Wisconsin Paper Mills Enjoy Three-Day Christmas Holiday — Rhinelander Disbursed 2 Per Cent of Earnings to 500 Employes — Pulp Shipments Increase for Year—Other Late Mill News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., December 27, 1937.—Employees of practically all of the Wisconsin paper mills enjoyed a three-day holiday for Christmas. Many of the mills closed down for Friday, Saturday and Sunday, and others run until noon on Friday.

Distributions of bonuses or gifts were announced by a number of plants. Rhinelander Paper Company, Rhinelander, Wis., disbursed approximately $80,000, representing two per cent of the year's earnings to 500 employees, and dividends of 20 cents per share to holders of common stock outstanding as of December 10. The bonus to many of the workers represents approximately one week's earnings, Folke Becker, president said.

One-hundred workers at the Appleton Woolen Mills, Appleton, Wis., received a fat turkey for their Christmas dinners. This custom has been carried on for sixty years.

Wisconsin Michigan Power Company, operating throughout the Fox River Valley paper mill district, gave its employees a bonus of four per cent on annual wages. The checks were distributed Christmas eve.

A dividend of five per cent to shareholders was announced by the Marathon-Menasha Credit Union, which has a membership of 500 among employes of the Marathon Paper Mills Company carton division at Menasha, Wis. The union made loans of $46,000 during the year, and has $25,000 outstanding at the present time.

Pulp Wood Shipments Increase 50 Per Cent

Wood pulp and pulp wood shipments handled through the port at Green Bay, Wis., during the last year showed an increase of almost 50 per cent. The tonnage for 1936 was 191,841, and preliminary figures for 1937 show a total of 283,403. Ocean and Great Lakes freighters bring the cargoes to Green Bay, from where they are re-distributed to numerous Wisconsin mills. Part of the material is delivered by barge to mills along the Fox River.

J. J. Plank Completes 20 Years Service

Joseph J. Plank, president of J. J. Plank & Company, Appleton, Wis., manufacturers of dandy rolls, has rounded out twenty years of service as a member of the municipal water commission of Appleton. He has been its chairman for fifteen years. The department has had a highly successful record of operation under his guidance, and has retired all of its outstanding bonds.

To Hold Hearing on Coal Freight Rates

Oral arguments on general revision of coal freight rates in Wisconsin are to be heard by the Wisconsin Public Service Commission soon after January 1, according to officials. A decision will then be reached. The matter has been pending all fall, and was the subject of several hearings following which briefs were filed. The Wisconsin Paper and Pulp Manufacturers Traffic Association has been among those clamoring for lower rates, and presented its arguments through Earl Bryan as spokesman. Abandonment of the "port equalization" principle is one of the chief contentions, a policy which grants the same rate to points more than 40 miles inland from Great Lakes ports, regardless of distance. Railroads have been opposing the revision.

Kimberly-Clark to Open New Warehouse

Opening of the large new manufacturing and warehouse unit of the Kimberly-Clark Corporation's Lakeview mill at Neenah, Wis., will take place shortly atfer the first of the year. The cellucotton division making Kotex, Kleenex and other products will be concentrated there. Seven hundred employees celebrated the opening with a dancing party at Rainbow Gardens, Appleton, Wis. Long service employees of the Badger-Globe division at Neenah were tendered a noon luncheon last week by the company, and afterwards enjoyed a tour of inspection of the new plant.

Amended Paper Machine Patent to Be Reissued

Reissuance of a paper-making machine patent on an invention by Charles R. Seaborne, of the Thilmany Pulp and Paper Company, Kaukauna, Wis., was announced last week. The amended patent, which takes effect December 28, 1937, covers the Seaborne rubber marking roll equipment used extensively in the Thilmany mill and in the American Lakes Paper Company since 1923 in connection with the manufacture of strip-marked and design-marked wrapping paper.

Handbook on Eye Hazards in Industry

To secure wider distribution of its book on "Eye Hazards in Industrial Occupations" by Louis Resnick and Lewis H. Carris, the National Society for the Prevention of Blindness is now offering copies at the special price of 50 cents each as long as the supply lasts. This book, which sold formerly at the actual cost price of $1.50, was published in 1924. Although some of the photographs show safety devices which have since been improved upon, the contents remain a valuable guide to safe practices in industry.

"Eye Hazards in Industrial Occupations" is a handbook for safety engineers, safety inspectors, safety committeemen, industrial physicians and nurses, for those responsible for industrial operations, whether owners, managers, or members of the operating staff; for governmental officials, trade association executives, and social agency officers; and for the many others who share the responsibilities and opportunities for conserving the life, health and sight of the millions of men, women and children employed in industry.

The volume contains 247 pages, and includes 59 illustrations dealing with the safeguarding of eyesight in factories, mines, shops and offices. Orders or inquiries concerning this volume should be addressed to the National Society for the Prevention of Blindness, 50 West 50th street, New York City.

Financial News of Pulp and Paper Industry

Whiting-Plover Interests To Control Stock — Marathon Reports Net Earnings Equal To $4.10 Per Common Share — Holberg To Pay Common Dividend — Celotex Would Buy Certain-teed Stock — Other News.

New York Stock Exchange

High, Low and Last for the Week Ending December 29, 1937

	High	Low	Last
A. P. W.	3⅛	2½	2⅝
Armstrong Cork Co.	38	30	32
Celotex Corp.	24¼	19⅛	20¼
Celotex Corp., pf.	61	55	55
Certain-Teed Products Corp.	7¾	6¼	6⅝
Certain-Teed Products Corp., pf.	29	23½	23½
Champion Paper & Fibre Co.	32½	27	28
Champion Paper & Fibre Co., pf.	104	104	104
Congoleum-Nairn Co.	21½	20	21
Container Corp. of Amer.	13⅜	11¾	12¼
Continental-Diamond Fibre Co.	7⅜	7¼	7¼
Crown-Zellerbach Co.	10⅜	8⅞	9
Crown-Zellerbach Co., pf.	63	57⅛	58
Flintkote Co.	17½	14⅞	14⅞
Robert Gair	3⅞	3	3¼
Robert Gair, pf.	14⅛	11½	13
International Paper & Power	8½	6¼	7⅜
International Paper & Power, pf.	38	29½	30¼
Johns-Manville Corp.	86½	77	79¼
Johns-Manville Corp., pf.	123	120	12?
Kimberly-Clark Corp.	19¾	17¾	17⅞
MacAndrews & Forbes, pf.	125	123⅛	123⅛
Masonite Corp.	35¼	31¼	32
Mead Corp.	12⅜	10	10¾
Mead Corp., pf.	53¾	49½	49½
Paraffine Companies, Inc.	40	34½	34½
Ruberoid Co.	23½	21½	21½
Scott Paper Co.	38⅛	36	38
Sutherland Paper Co.	19½	17½	17⅞
Union Bag & Paper Corp.	9⅜	9	....
United Paperboard Co.	4⅝	3⅞	3⅞
U. S. Gypsum Co.	72½	65	70

New York Curb Exchange

High, Low and Last for the Week Ending December 29, 1937

	High	Low	Last
American Box Board Co.	8⅜	7	7¼
Brown Co., pf.	26½	19	20
Great Northern Paper	32½	31½	31½
St. Regis Paper Co.	3⅛	2⅜	2⅜
St. Regis Paper Co., pf.	58	57	57
Taggart Corp.	4	3⅝	3⅝

Whiting Interests To Control Stock

The Whiting-Plover Paper Company, Stevens Point, Wis., has sent out the following announcement:

"E. A. Oberweiser, who has for the last seven years been president and general manager of the Whiting-Plover Paper Company, is severing all connections with the company and is selling his minority stock interest. All stock in the company will be held by the Whiting interests.

"Frank B. Whiting, son of the founder Geo. A. Whiting, who has been vice-president for twenty-six years, will succeed as president.

"Joseph H. Miller, who has been with the company for twenty-seven years, will be vice-president and general manager. Mr. Miller has been assistant general manager in charge of production for the last ten years.

"George Hilton will continue as secretary. Geo. A. Whiting, son of Frank B. Whiting, will be treasurer.

"C. W. Spickerman will be general sales manager, and has been with the company for twenty-six years. Louis Gailer will continue as eastern manager. R. F. Bellack will continue to handle our advertising.

"We wish to state that on account of countless rumors to the contrary, all stock of the Whiting-Plover Paper Company will be owned and controlled by the Whiting interests who have controlled its management and majority stock holdings since it was first founded by the late Geo. A. Whiting, who discovered the wonderfully pure water with which its line of Permanized Papers are made.

"We take this opportunity to thank all customers and friends who have helped make our success possible."

Marathon Reports Profitable Year

[FROM OUR REGULAR CORRESPONDENT]

ROTHSCHILD, Wis., December 27, 1937.—Profit of the Marathon Paper Mills Company for the year ending October 31, 1937 was $820,506 after deduction of preferred dividends, according to a report made by D. C. Everest, vice-president and general manager, at the annual meeting of stockholders last week. Net profit from operations was $856,506 after deduction of $197,229 in certain non-recurring items.

Net earnings amount to $4.10 a share on 200,000 shares of common stock outstanding, as compared to $2.23 for the previous year.

All of the officers were re-elected, and in addition, Leo E. Croy of the Menasha Products division at Menasha, Wis., was elected a vice-president. The remaining officers are: C. C. Yawkey, president; D. C. Everest and John Stevens, Jr., vice-presidents; P. M. Wilson, secretary-treasurer, and A. M. Van Douser, assistant secretary-treasurer. The directors re-elected in addition to the officers are Charles S. Gilbert, M. P. McCullough, Ben Alexander and C. J. Winton, who is from Minneapolis, Minn.

Reports showed that considerable work had been done during the last year on physical improvement of plant, including a new building to house the wax paper division at Menasha, Wis. The facilities of all the company's mills are now shown to be in the best condition they have ever been.

Recently the company declared a dividend of $3 per share on common stock, payable in 6 per cent preferred stock. The outstanding shares were increased from 6,000 to 12,000 for this purpose.

Hoberg Declares Dividend on Common

[FROM OUR REGULAR CORRESPONDENT]

GREEN BAY, Wis., December 27, 1937.—Hoberg Paper Mills, Inc., has announced a dividend of 75 cents per share on the firm's new common stock. The dividend was payable December 24 on stock as of record December 20. The directors also voted a dividend of $1.50 on preferred stock, payable on the same date.

Celotex Nets $1,266,753

The Celotex C rporation and subsidiaries had a net profit of $1,26. 53 for the year ended on October 31, after interes , depreciation, Federal income taxes and other charges, according to the annual report which was made public yesterday. After dividend requirements on the 5 per cent preferred

stock, the profit was equivalent to $4.17 each on 268,685 shares of common stock. In the preceding fiscal year the net profit on the same basis was $736,014, or $2.19 a common share.

Current assets on October 31 amounted to $3,926,856, including $1,048,726 cash, while current liabilities amounted to $1,063,454. At the close of the previous year cash amounted to $892,468, current assets to $3,443,419 and current liabilities to $873,062.

Protection Against Credit Losses

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., December 27, 1937.—A meeting of credit managers of a number of representative merchants was held Wednesday at the Boston Chamber of Commerce to see what steps could be taken for mutual protection against credit losses and for cooperation on other credit problems. Further study of these matters was referred to a committee composed of John C. Hurd, chairman; W. F. Brown treasurer and credit manager of the D. F. Munroe Company; Mr. Catharine of the Stone & Forsyth Company, and Miss McGuiness of Ginsburg Bros., Inc., Cambridge, Mass. John C. Hurd, executive secretary of the New England Paper Merchants Association, presided.

Celotex Would Buy Certain-teed Stock

The Celotex Corporation, manufacturers of insulating materials, has announced a plan to acquire substantial holdings in the Certain-teed Products Corporation, manufacturers of asphalt and gypsum products.

Bror G. Dahlberg, president of Celotex, said the plan contemplated acquisition of 9,496 shares of preferred and 109,360 shares of common stock of Certain-teed, now held by the Phoenix Securities Company of New York.

In payment Celotex would issue 43,744 shares of its own common stock and pay $569,760 in cash. Dahlberg said the plan would be submitted to Celotex stockholders at the annual meeting in Chicago, January 18.

Sorg Paper Co. Omits Dividend

The Sorg Paper Company has omitted the dividends on the 6 per cent preferred stock and the Series B 4 per cent—6 per cent cumulative preferred stock due at this time. Disbursements of $1.50 a share on the 6 per cent preferred and $1 on the Series B 4 per cent—6 per cent cumulative preferred were made on October 1.

Puget Sound Reports $295,481

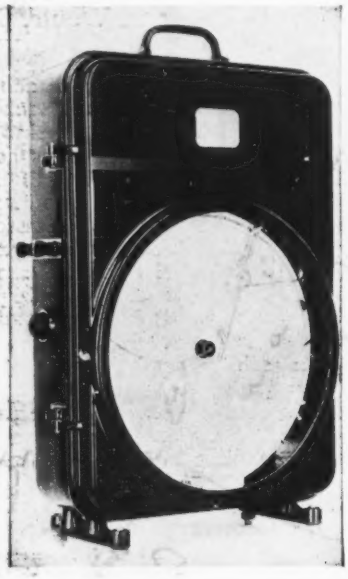
The Puget Sound Pulp and Timber Company and subsidiary for the eight months ended August 31, reported profit of $295,481 after taxes and charges.

Bandless Beater and Braker Rolls

Dilts bandless beater and breaker rolls are described in a pamphlet issued by the Dilts Machine Works, Inc., of Fulton, N. Y. The merits of the company's double suspension spring bearings, as used with the rolls, are also explained.

New Portable Pyrometer

The instrument shown in the illustration is a new Portable Recording Pyrometer—one of a new line of Pyromasters manufactured by The Bristol Company, Waterbury, Conn. The simple operating principle of these instruments and their compactness of construction, give them special features that are especially useful for portable service. In summary these features are as follows:



The instrument is unusually rugged—not affected by vibration — does not require careful leveling while in use. There are no continuously moving parts or trains of gears to become engaged and released to position the pen on the chart—no mechanical motion of any kind, except when a change in temperature occurs at the thermocouple.

When an unbalanced condition in the potentiometer circuit occurs, a series of relay-actuated switches operate a motor to position the slide wire contact to which the pen arm is mechanically connected.

The galvanometer is equipped with a highly damped coil—the galvanometer arm is free to deflect at any time, not being periodically engaged by a clamping device.

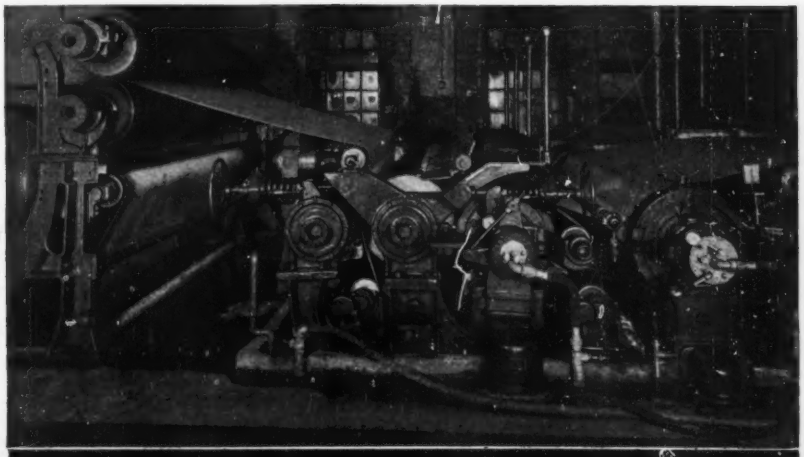
The instrument is constructed so that it is composed of five separate replaceable units—there is no mechanical connection between the galvanometer and any of these units, the connection being electrical, only.

Bristol's Portable Pyromasters are available as Pyrometers for ranges from 0 to 500 up to 0 to 3000 degrees F., using standard thermocouples. They are also available as Resistance Thermometers, for ranges from 20 to 350 degrees F. Provision is made on the case for suitable plugging devices to connect these instruments to the thermocouple or resistance bulb, and to a source of a-c power, 110 to 220 volts. The chart is 12 inches in diameter and rotation is by telechron clock.

Bulletin No. 489, now available, describes Bristol's Pyromaster recorders, controllers, and indicators.

Industrial Thermometers

A new catalogue of industrial thermometers, No. 1125B, has been issued by the C. J. Tagliabue Manufacturing Company, of Brooklyn, N. Y. The instruments listed include metal and wood back thermometers, hygrometers, U-gauges, mercurial vacuum gauges and mercurial barometers.



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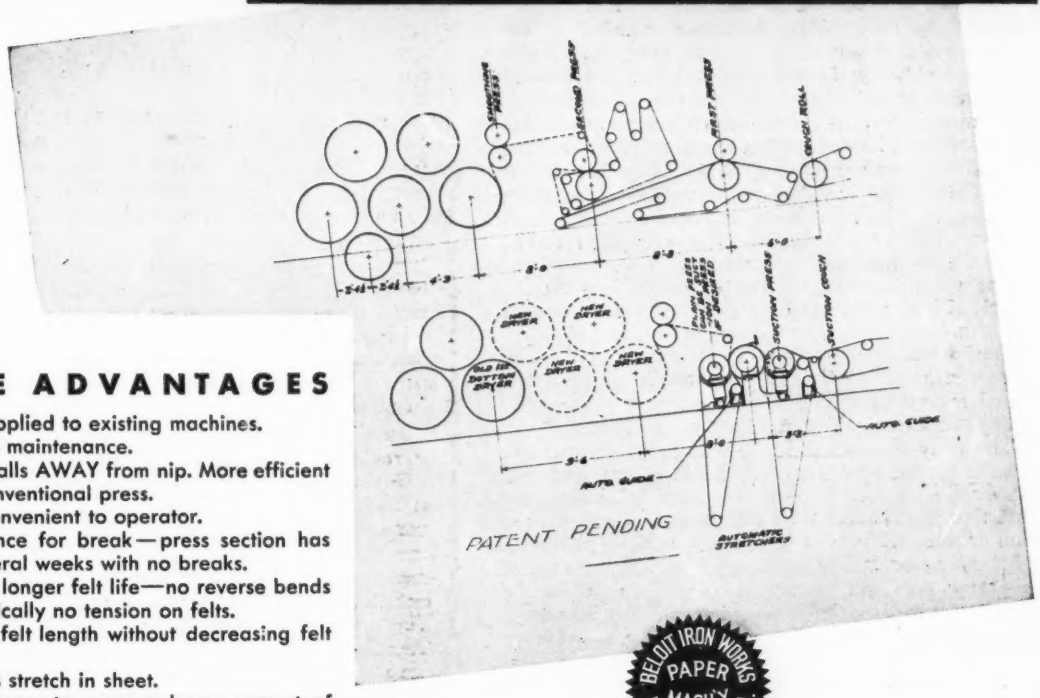

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Sulphonated Oils in Paper Coating Processes*

By H. W. Rose[1]

Paper coating involves the use of a number of ingredients, the chief of which are of course the adhesives, whether casein, glue, starch or albumen—and the minerals or fillers such as clay, talc, satin white or blanc fixe.

The minor ingredients are soaps or waxes, anti-froth or sulphonated oils, glycerine, etc. These latter ingredients, while minor in their quantity, often assume an importance all out of apparent proportion to their quantity either by virtue of their use or by the omission of their use.

Narrowing down our discussion to the anti-froth or concentrated oils, it is often claimed by mill men that they are only a necessary evil to correct a disease. Yet, the disease being existent and prevalent, a cure is necessary. Their use, at least under the present system of paper coating, seems to be necessary.

It is my intention to outline the nature and origin of fats and oils, their manufacture into sulphonated products, together with an outline of methods of analyzing and evaluating these products.

The fatty oils, solid fats and waxes are found ready formed in vegetable and animal organisms. It appears to be certain that oils and fats are formed from carbohydrates. Thus it seems that in the olive fruit, mannite is transformed into oil, and in rapeseed, poppyseed and linseed, starch seems to play the same part which mannite plays in olive. In these organisms, there occur a number of enzymes (diastase, lipase etc.) which probably effect the synthesis of oils and fats by a series of reactions which follow somewhat rapidly one upon another.

The vegetable waxes occur as exudations on the leaves, stems and fibers of plants. The solid animal waxes are also mostly exudation products.

Considered chemically, the fatty oils and solid fats are the glycerides of fatty acids, whereas the waxes are esters formed by the union of fatty acids with alcohols belonging to the glycerol series.

The fatty oils and solid fats, as previously stated, are the products of the combination of glycerol and fatty acids. Glycerol being a tri-hydric alcohol, we find that each molecule of fat consists of a combination of one molecule of glycerol with three molecules of the fatty acid. The resulting compounds are called tri-glycerides. We apparently find in nature only the tri-glycerides and not the mono- or di-glycerides.

These tri-glycerides are readily split up so as to yield one molecule of glycerine and three molecules of fatty acid by a process called saponification. Upon this reaction is based the manufacture of soap. In the soap industry, this chemical change is effected by boiling the fats with strong bases such as caustic soda, caustic potash, etc.

In the sulphonation process, we start with tri-glycerides of the various fatty acids. Here, the intention is not to saponify these tri-glycerides but to produce a sulphuric acid ester of the tri-glyceride. In order to accomplish this esterification or sulphonation as it is more commonly called, it is necessary that the particular fat or oil used have an unsaturated constituent or a double bond which chemically expresses unsaturation. It may also contain a hydroxyl group which likewise is capable of sulphonation. Thus it is that the nature of the fat employed determines the degree of sulphonation. For example, such fats as stearin and palmitin cannot be sulphonated inasmuch as these fats are fully saturated and sulphonation does not take place. The oils and fats most commonly used in the paper industry seem to be confined almost entirely to: 1. castor oil and 2. tallow.

Tallow consists of a mixture of olein, stearin and palmitin. In such a case, sulphonation only occurs in the olein constituent and the degree of sulphonation is determined directly by the proportion of olein present in the tallow. With tallows of low titre, that is, where the proportion of olein is high, sulphonation can be effected much more readily and to a higher degree, than in the case of high titre tallows where the relative proportion of olein to stearin and palmitin is much lower.

Olive oil and tallow contains double bond only. Castor oil contains both a double bond and a hydroxyl group. Cocoanut oil, contrary to common belief, cannot be sulphonated to any practical degree, as it contains only 2 per cent olein, its only unsaturated constitutent.

Castor oil is the oil produced by pressing the seeds or beans of a plant found in enormous quantities in all tropical and sub-tropical countries. It even grows wild in South America, notably in Paraguay and the Argentine. However, the greatest quantities of castor beans are imported into this country from Africa and India.

Castor oil contains the mixed glycerides of ricinoleic acid, oleic acid, linoleic acid, stearic acid and dihydroxystearic acid. Tri-ricinolein, which exists in at least two isomeric forms, composes from 80 to 90 per cent of the oil.

Why Sulphonate Oils?

The question arises, what are sulphonated oils, and why sulphonate oils at all? This question is answered by referring to the old adage wherein it is stated that oil and water do not mix. In the sulphonation process, we produce an oil which does mix with water. In other words, the object of sulphonating is to produce a water soluble or water emulsifiable oil. Sulphonated oils are really not sulphonated at all, but are actually the half sulphuric acid esters of fatty acids or esters.

It has been known, perhaps for 100 years, that if concentrated sulphuric acid be mixed with oils and fats very carefully and at a low temperature, glycerides of a complex constitution are formed.

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* Presented at the meeting of the Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry, Kalamazoo, Mich., May 6, 1937.

[1] Technical Representative, American Cyanamid and Chemical Corporation, New York, N. Y.

This reaction is employed on a large scale to produce the sulphonated castor oil of commerce, better known as turkey red oil. Originally, turkey red oil was used in the preparation of the cotton fiber for dyeing and printing turkey red color, hence the name. Turkey red oil has been produced commercially as far back as 1875.

The predominant fatty acid of castor oil is ricinoleic acid: $(C_{18}H_{34}O_3)$ $CH_3(CH_2)_2$ CH = $CH(CH_2)_2$ $CHOH(CH_2)_9$ COOH. This has two possibilities for sulphonation, the OH-group on the eighth carbon atom and the ethylene linkage between the fourth and fifth carbon atoms. All sulphonated castor oils undoubtedly contain both types of ester. However, the properties of the oils vary considerably depending upon which type predominates. The resistance of a sulphonated castor oil to the effects of acid in a dyebath is particularly affected by the point at which the ester occurs. The ester formed at the hydroxyl group gives an oil which makes a clear solution in water and that formed at the double bond tends to give a cloudy solution. It is important to control the type of ester formed and it has been found that by carefully controlling temperatures, during sulphonation, this can be accomplished.

The sulphonating agents are sulphuric acid of various strengths ranging up to fuming sulphuric or oleums, chlorsulphonic acid or even sulphur trioxide.

The actual formation of the sulphuric acid ester is carried out either by direct addition at the ethylene or double bond linkage with consequent saturation, or by reaction with the sulphonating agent at the hydroxyl group of the fat with the formation of water, or, where chlorsulphonic acid is used, the formation of hydrogen chloride.

This all seems very simple—just permit equivalent portions of the fat and sulphonating agent to react under the proper conditions and an equivalent amount of the ester is formed. However, it is not so simple. The law of mass action plays an important part. Because no product of reaction is removed from the mixture, the desired reaction does not run to completion, but approaches an equilibrium where the rate of decomposition equals the rate of combination. This equilibrium may be displaced, within limits, by varying the ratio of the reacting substances.

Sulphonated castor oil is manufactured by allowing the sulphonating agent to carefully run into castor oil slowly with constant stirring, taking care that a temperature of 35 deg. C. is not exceeded. Constant cooling is necessary, in as much as considerable heat is evolved in this reaction. In addition to sulphonation, a number of side reactions occur, such as hydrolysis of the glycerides with the formation of free fatty acid, polymerization, oxidation of the fat and reduction of the sulphonating agent, and hydrolysis of the acid ester accompanied by the formation of saturated hydroxy acids.

Equilibrium is never actually reached, because in order to produce a desirable sulphonated oil, the reactions must be ended when the maximum quantity of the sulphuric ester of the fat has been formed. This latter determines the degree to which the oil disperses in aqueous emulsions.

It is a common error to assume that sulphonated castor oil is just sulphonated castor oil. However, the side reaction products greatly influence the general characteristics of the oil as well as its useful application. This accounts for the wide variety of sulphonated castor oils. In our own three sulphonating plants, we manufacture at least a dozen different types of sulphonated castor oil, each of which has a particular property or quality necessary for a specific application.

Glycerine formed during the reaction, by the hydrolysis of the glyceride, is generally completely removed from the sulphonated oil during the washing process and is thrown away. During the present high prices of glycerine, some thought has been given to the possibility of recovering this lost glycerine, but even at the present high market, the recovery of the glycerine does not seem economically feasible.

After the sulphonation has been allowed to proceed to the desired end point, the mass is washed. This washing process may be effected with either a brine solution, a glaubers salt solution or with a strong alkali solution. In each case the washing methods vary widely and have considerable further bearing on the nature of the finished product.

The sulphonated mass is now separated from the washing medium. Sulphonated oils after washing, are unstable. The acid ester has fat splitting properties and tends to increase the free fatty acid content, while the small amount of mineral acid present together with inorganic sulphates and water tend to hydrolyze the sulphuric ester and form saturated fatty acids. Consequently, they must be neutralized with alkali to guard against hydrolysis on storage. Finally, we end up with either a sodium, potassium or ammonium salt of the sulphuric acid ester as the commercial sulphonated castor oil we all think we know so well.

The evaluation of a sulphonated oil both for its money value and for its applicability to a particular job or process is a subject which has long been studied. The latter evalution, that is as to its applicability, while susceptible of laboratory methods, is best tried out in actual application. The money evaluation is strictly a laboratory matter.

Now, what is it that intrinsically determines the money value of a sulphonated oil? Naturally enough, it is the actual total fat content, however that fat is bound or contained in the sulphonated oil. Conversely, the amount of water present in the oil determines the lack of money value, inasmuch as the difference between 100 per cent and the percentage of water yields a figure close to the total active ingredients of the oil, assuming no adulteration is present.

Analysis of Sulphonated Oils

The methods of analysis of sulphonated oils as worked out by the Association of Textile Chemists and Colorists, have been adopted as the official methods by the Sulphonated Oil Manufacturers Association. These have been compiled in pamphlet form, and copies of this booklet are available.

These methods include the determination of:

1. Moisture
2. Inorganic Salts
3. Total Alkalinity
4. Organically combined SO_3
5. Total fatty matter
6. Total sulphated fatty matter
7. Total active ingredients
8. Unsaponifiable.
9. Free fatty acids

Moisture is readily determined by distilling the sample with a volatile solvent such as xylol in a suitable apparatus, and by a direct reading of the volume of water thus distilled over.

Inorganic salts are determined by ignition.

Total alkalinity is determined by titration with standardized sulphuric acid.

Combined SO_3 is determined by splitting the oil with strong acid and titrating the increase in acidity produced by the split SO_3.

Total fatty matter is determined by decomposing the sulphonated oil with dilute mineral acid, and extraction of the decomposed fat with ether, and then weighing the fat thus extracted.

Total sulphated fatty matter may be determined by extracting the undecomposed sulphonated oil over a concentrated salt solution, or it may be estimated by calculation as it is equal to the sum of total fatty matter and neutralized organically combined SO_3.

Total active ingredients: This includes everything in the sulphonated oil that determines money value. It is calculated as the percentage of total sulphonated fatty matter plus the percentage of total alkalinity combined as soap.

Unsaponifiable matter (which should not be present) is determined by dissolving the split fat in alcohol and extracting the solution with ether.

Free fatty acids are determined by titrating with standard alkali.

Degree of Sulphonation

A common argument of sales talk is to claim complete sulphonation of a particular oil. This is a myth, as sulphonation is never complete. A high degree of combined SO_3 is desirable for some purposes, highly undesirable for others. As combined SO_3 increases, all other factors being equal, the tendency towards formation of insoluble soaps in hard water decreases. To obtain higher degree of sulphonation, many methods are used, among them the use of inert diluents, which are removed from the finished product, the addition of lower aliphatic acids, anhydrides and halides, and the use of mutual solvents for the sulphonating agent and oil, such as SO_2 in which is dissolved SO_3.

Another factor which has been shown to affect the formation of insoluble calcium and magnesium soaps is the total alkali content of the oil, or the alkali bound as soap. When the total alkali is high, the formation of insoluble soaps in hard water is very rapid, but when the total alkali is low, the rate of formation of these soaps is greatly decreased. This is explained on the theory that the hydrolysis of the soap in water facilities a double decomposition reaction between the soap and soluble calcium and magnesium salts. On the other hand, the ionization of fatty acid is very small, thus retarding its reaction with these salts to form insoluble soaps.

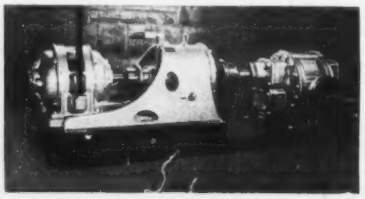
Sulphonated castor oil in paper coating is ordinarily considered as an anti-froth oil. This is a curious anomaly, since in other industries, sulphonated castor oil is considered to be a foaming medium. Consider the textile industry wherein it is used as a detergent in the cleansing and scouring processes. Also the beauty and cosmetic industry where it becomes milady's hair shampoo, etc.

It is generally considered that in the paper color mixture the chief offender in the way of foam producers is casein. Certain types of casein yield foam which is the bane of the coating superintendent. Bubbles of air or gas are entrained in the mix, causing pin holes in the coating. The addition of a suitable type of sulphonated castor oil seems to aid in the dissipation of these air bubbles.

It would seem more proper to regard sulphonated castor oil as a leveller and smoother for the coating mixture. The emulsifying action of the sulphonated oil serves to reduce the interfacial tension between the solid and liquid phases of the mix as well as the surface tension of the paper. Thus the particles of filler tend to smooth out more evenly under the brushes, and resist-spots in the paper, if any exist, are wet out more uniformly, eliminating the possibility of fish eye formation. A suitable type of sulphonated castor oil designed to emulsify well in the highly alkaline coating color would seem to be more desirable than foam preventatives of the nature of pine oil which in itself is non-emulsifiable and whose odor has little to recommend it.

Liquids of Varying Viscosity Handled by Unique Pumping Unit

A unique compact pumping unit for bulk transfer service where both thin and highly viscous liquids are handled has been developed by Worthington Pump and Machinery Corporation of Harrison, N. J. The pump is of the herringbone-gear - impeller type driven by a constant - speed motor or internal combustion engine through a two-speed, enclosed transmission. For light liquids, the pump may be operated at high speed, while for viscous liquids the speed of the pump may be reduced. In either case, the full power of the prime mover is employed.



In conventional applications of single pumping units on such service, motors are selected for the heaviest loads and are operated at a fraction of their rated power when pumping the thinner liquids. The new two-speed unit affords maximum efficiency because a relatively small constant-speed driver is used.

The manufacturer states that various applications of these units have proved satisfactory, due to the self-priming high-suction qualities and positive displacement features in the pump. There are no valves to retard the liquid flow, and the entire unit requires little space.

New Thermometer Bulletin

The new Thermometer bulletin, 198-1, just issued by the Foxboro Company, Foxboro, Mass., is as free from technicalities and as interesting in arrangement as it is possible to make such a subject. A brief story on the value of thermometers is followed by separate descriptions of the thermometers associated with the Foxboro trade mark. Here everything is done to help the reader to find what he wants. The story of each class is complete and continuous. Its appearance, its range characteristics, its thermal system and its special bulbs are all illustrated and described within the limits of four pages. The same plan is followed for other sections of information. Everything is grouped under easily recognizable headings.

Men who know little of thermometry and men who have used thermometers all their lives will equally find this bulletin easy to understand and to handle.

OLIVER UNITED

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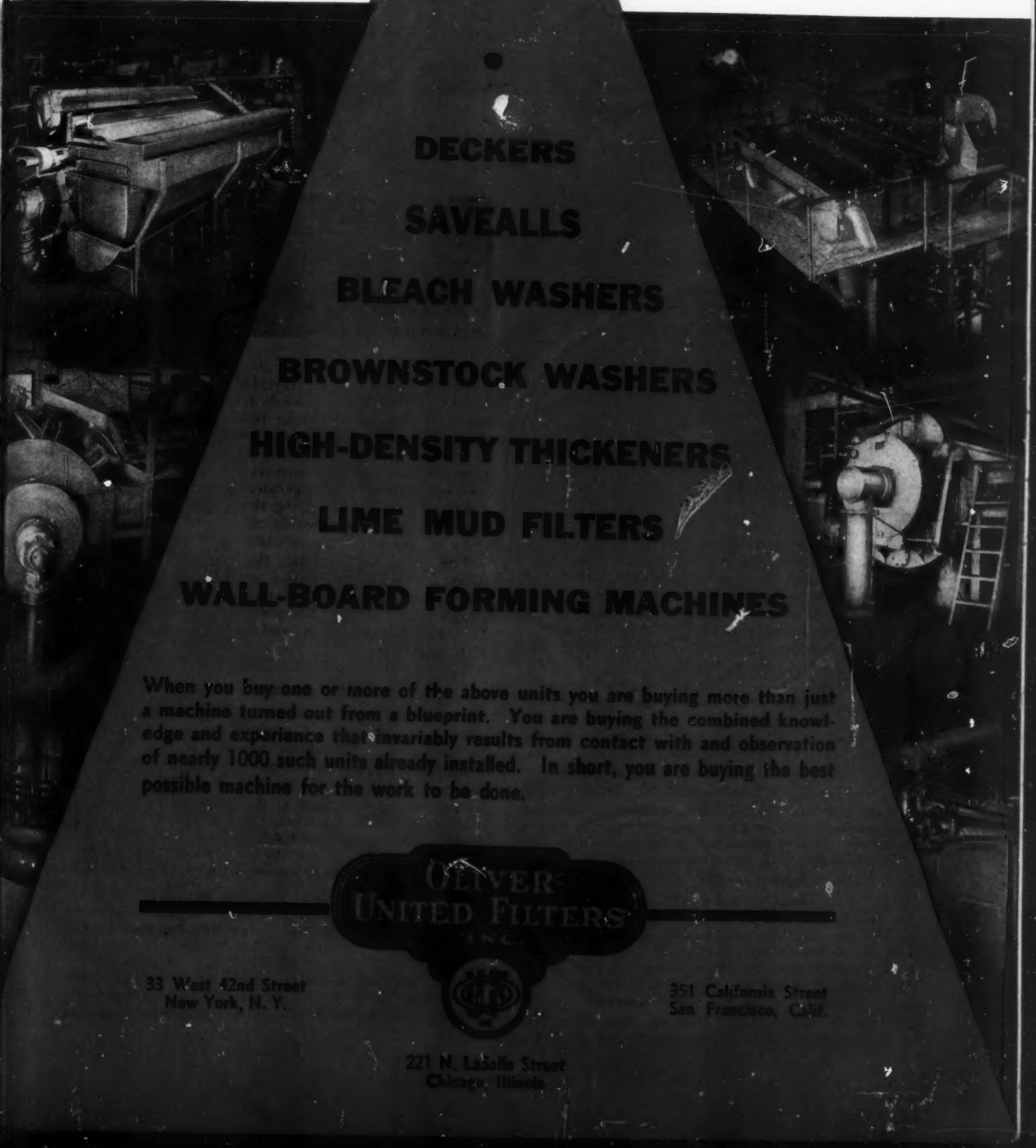
SERVICE



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When you buy one or more of the above units you are buying more than just a machine turned out from a blueprint. You are buying the combined knowledge and experience that invariably results from contact with and observation of nearly 1000 such units already installed. In short, you are buying the best possible machine for the work to be done.

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Paperboard Industry Runs at 56 Per Cent

Monthly statistics in paperboard .012 of an inch in thickness for November compared with the preceding month have just been released by Director William L. Austin, Bureau of the Census, Department of Commerce. The statistics were compiled from data furnished by the National Paperboard Association from reports of members and by manufacturers reporting direct to this Bureau.

The production of paperboard for November 1937 amounted to 267,567 short tons, or 56 per cent of the rated capacity of the mills reporting. The ratio of inch hours of operation to rated capacity for November 1937 was 57.3 per cent, as compared with 67.8 per cent for October 1937, 80.5 per cent for November 1936 and 77.4 per cent for November 1935.

TABLE I.—INCH HOURS OPERATED, PRODUCTION, AND ORDERS (99 MANUFACTURERS FOR MONTHS OF 1937, AND 95 FOR MONTHS OF 1936 AND 1935)

Year and Month	Operated (Inch hours) (Based on last dryer width)			Production (Short tons)		New orders received during month (short tons)	Unfilled orders, end of month (short tons)
	Rated capacity	Operation for month	Per cent of rated capacity	Rated capacity	Production during month		
1937							
Jan.	15,359,197	12,245,898	79.7	445,686	365,665	407,716	221,409
Feb.	14,277,332	12,327,520	86.3	414,796	373,431	386,781	236,011
Mar.	16,366,534	14,171,655	86.6	467,701	428,506	453,621	265,575
Apr.	16,528,775	14,750,097	89.2	470,851	436,610	419,702	243,486
May	15,399,621	13,298,991	86.4	437,266	397,073	346,525	194,458
June	16,654,846	12,581,325	75.5	473,069	380,882	329,244	146,138
July	16,738,295	11,647,090	69.6	488,591	346,721	331,375	143,401
Aug.	16,258,798	12,246,074	75.3	482,682	365,287	348,685	129,745
Sept.	16,276,557	11,630,152	71.5	487,172	348,091	324,216	108,467
Oct.	16,327,294	11,073,060	67.8	488,232	334,619	315,122	88,775
Nov.	15,939,070	9,133,349	57.3	477,417	267,567	254,781	74,173
Total (11 mos.)	176,126,319	135,105,211	76.7	5,133,463	4,044,452	3,917,768	.....
1936							
Jan.	15,251,225	9,970,298	65.4	427,564	271,210	284,854	95,358
Feb.	14,173,988	9,682,428	68.3	396,354	271,107	268,843	91,917
Mar.	14,583,725	10,128,474	69.5	411,199	285,257	290,854	96,202
Apr.	14,630,429	10,495,934	71.7	412,267	295,899	297,984	99,796
May	14,497,925	10,140,595	69.9	407,729	289,527	280,899	92,784
June	14,545,973	10,186,905	70.0	409,510	288,682	290,098	96,402
July	15,057,386	10,699,561	71.1	431,139	299,033	304,747	101,557
Aug.	14,545,972	11,122,150	76.5	416,338	319,391	332,553	117,443
Sept.	14,466,821	11,359,779	78.5	415,126	328,519	353,197	135,732
Oct.	15,189,530	12,669,229	83.4	435,081	359,849	357,783	138,830
Nov.	14,097,513	11,350,376	80.5	403,871	321,624	308,732	127,193
Total (11 mos.)	161,040,487	117,805,729	73.2	4,566,178	3,330,098	3,370,544	.....
Dec.	15,177,270	11,537,682	76.0	434,969	328,773	350,452	130,472
Total (Year)	176,217,757	129,343,411	73.4	5,001,147	3,658,871	3,720,996	.....
1935							
Jan.	15,455,578	9,793,592	63.4	416,501	262,026	273,151	80,987
Feb.	13,636,918	9,308,323	68.3	366,598	251,870	252,578	84,341
Mar.	14,709,922	10,029,490	68.2	398,949	275,770	268,360	79,049
Apr.	14,901,848	9,543,895	64.0	402,831	260,851	255,730	79,296
May	15,498,589	9,615,348	62.0	418,324	262,463	259,995	80,367
June	14,284,978	9,418,123	65.9	385,742	256,665	248,656	78,020
July	15,592,118	9,397,786	60.3	423,545	260,207	259,486	78,241
Aug.	15,592,118	10,450,399	67.0	423,545	291,127	297,349	86,767
Sept.	14,380,430	10,273,750	71.4	390,840	289,596	307,103	105,088
Oct.	16,108,039	12,404,641	77.0	434,717	345,596	351,887	107,074
Nov.	13,598,280	10,526,226	77.4	399,897	294,290	272,477	88,971
Total (11 mos.)	163,758,818	110,761,573	67.6	4,461,489	3,050,461	3,046,772	.....
Dec.	14,770,746	8,818,058	59.7	400,139	243,594	234,753	81,894
Total (Year)	178,529,564	119,579,631	67.0	4,861,628	3,294,055	3,281,525	.....

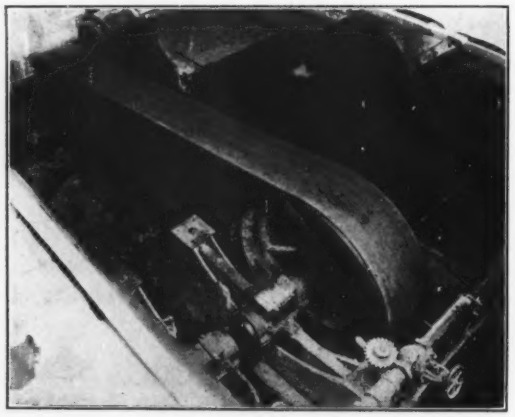
TABLE II.—CONSUMPTION AND STOCKS OF WASTE PAPER (85 MANUFACTURERS)

Year and Month	Consumption of waste paper (short tons)			Stocks of waste paper at plants, end of month (short tons)
	Rated capacity	Consumed during month	Per cent of rated capacity	
1937				
January	371,916	295,554	79.5	211,295
February	344,832	295,477	85.7	196,570
March	389,546	339,242	87.1	197,977
April	376,091	341,597	90.8	211,628
May	374,605	330,250	88.2	234,239
June	376,081	287,504	76.4	257,185
July	389,069	274,463	70.5	254,554
August	376,081	287,443	76.4	258,064
September	400,580	287,858	71.9	277,797
October	376,081	256,162	68.1	293,818
November	366,817	213,378	58.2	290,037
Total (11 mos.)	4,141,699	3,208,928	77.5	.....
1936				
January	370,319	229,064	61.9	216,040
February	343,024	226,216	65.9	193,919
March	356,763	237,601	66.6	204,376
April	356,829	245,738	68.9	204,353
May	356,463	241,895	67.9	213,435
June	359,359	241,656	67.2	218,330
July	371,692	249,402	67.1	219,042
August	359,360	268,770	74.8	207,886
September	357,870	281,046	78.5	191,408
October	376,498	306,874	81.5	189,590
November	349,317	274,332	78.5	182,822
Total (11 mos.)	3,957,494	2,802,594	70.8	.....
December	376,053	279,068	74.2	199,404
Total (Year)	4,333,547	3,081,662	71.1	.....
1935				
January	359,167	210,812	58.7	210,520
February	322,920	211,560	65.5	214,069
March	345,236	231,584	67.1	207,987
April	347,845	217,300	62.5	214,680
May	361,312	219,767	60.8	222,519
June	334,875	213,523	63.8	230,365
July	366,084	217,934	59.5	233,784
August	366,084	246,537	67.3	288,137
September	337,395	244,963	72.6	220,998
October	373,312	288,668	77.3	214,685
November	345,005	246,318	71.4	213,297
Total (11 mos.)	3,859,235	2,548,966	66.0	.....
December	344,705	196,429	57.0	211,029
Total (Year)	4,203,940	2,745,395	65.3	.....

Endless Rubber Belt Proves Endurance

The beater drive represented in the accompanying illustration is considered one of the most difficult in the mills of a large Massachusetts paper company. It operates off a 100 hp. motor fitted with a 17½-inch diameter pulley driving a 60 inch pulley on 14 foot, 4 inch centers. Belt speed is 1800 r.p.m.

Prior to August 28, 1936, only premium belts of material other than rubber had been used on this drive. On this date, however, a 20 inch wide, 8-ply



APPLICATION IN MASSACHUSETTS MILL

Goodrich Highflex Belt was made endless on the pulleys by the Plylock Splicing Method. Today, after 16 months' continuous service, the belt is still operating smoothly and its freedom from stretch is best indicated by the fact that although the base of the motor provides a 10 inch take-up it has been moved but 2 inches to date.

TARIFF COMMISSION REPORTS ON WOOD PULP

(Continued from page 13)

TABLE II.—WOOD PULP AND PULPWOOD.—CONTRIBUTIONS OF DOMESTIC AND FOREIGN PULP AND PULPWOOD TO TOTAL UNITED STATES REQUIREMENTS, 1936

	Wood pulp			
		Imported in the form of—		
	Production	Pulp	Newsprint paper	Total requirements
	Quantities in thousands of tons of 2,000 pounds			
Sulphite	1,830	1,299	578	3,707
Sulphate	1,802	738	....	2,540
Ground wood	1,496	228	2,311	4,035
Soda	403	13	....	416
Semichemical	95	....	....	95
Total	5,626	2,278	2,889	10,793
	Ratio to total wood pulp requirements, Per cent			
Sulphite	49.4	35.0	15.6	100.0
Sulphate	70.9	29.1	...	100.0
Ground wood	37.1	5.6	57.3	100.0
Soda	96.9	3.1	...	100.0
Semichemical	100.0	...	...	100.0
Total	52.1	21.1	26.8	100.0

Pulpwood				
Consumption of—				
Domestic wood	Imported wood	Wood equivalent of imported pulp	Wood equivalent of imported newsprint	Total requirements
	Quantities in thousands of cords			
8,271	899	4,116	3,384	16,670
	Ratio to total pulpwood requirements			
49.6	5.4	24.7	20.3	100.0

By reason of the large expansion of pulp production in the South and on the Pacific coast, the dependence of the United States on imports of paper and materials therefor has not changed materially in the last 10 years, but is much greater than before or immediately after the World War. The large importation is explained by the depletion of the stands of spruce and balsam fir in the Northeastern and North Central regions of the country in areas close to established mills.

An important feature of the situation is the regional distribution of the domestic pulp industry in relation to paper consumption. The areas of large paper consumption are in the northeastern quarter of the country. The Northeastern and North Central States produce much less of all three products—pulpwood, wood pulp, and paper—than they consume. The upward trend of United States pulpwood and pulp production in the last decade is accounted for by increases in the Southern and Pacific coast regions, which produce pulpwood and wood pulp greatly in excess of their paper requirements. Pulpwood and pulp production in the Northeastern and North Central regions has in the past decade shown a downward trend: these two areas take the bulk of the imports of pulpwood, almost entirely from eastern Canada; of wood pulp, chiefly from Europe but also in large amounts from Canada; and of newsprint paper, chiefly from Canada. In addition, they draw large quantities of kraft wrapping paper and container board from the South and considerable pulp from the Pacific coast.

Ground wood, a kind of pulp used principally in the production of newsprint and other of the cheaper "white" papers, is produced in large quantities in the New England, Middle Atlantic, and Lake States, and also in considerable quantities in the Pacific coast region.

The production of sulphite pulp in the United States is distributed in much the same way as that of ground wood, except that a larger proportion is produced in the Pacific Northwest. The marked expansion of pulp production in the Pacific coast region in recent years has been principally in sulphite, which is used in admixture with ground wood and other materials in making many kinds of white papers.

Pulp production in the South is confined almost entirely to sulphate (kraft) pulp, used principally in brown wrapping paper and container board. Sulphate pulp is also produced in substantial quantities in Michigan, Wisconsin, and Minnesota, and in the Pacific Northwest, but the great increase in sulphate production in recent years is accounted for by the expansion of the Southern industry. In spite of this expansion of domestic production, increasing quantities of sulphate pulp have been imported. The increase in the United States consumption of such pulp is due mainly to the increased demand for fibreboard container.

Wood pulp is produced in the United States principally by integrated departments of pulp-paper mills. Nearly all the domesitc output of kraft pulp and of ground wood is produced in such integrated establishments, and little of these kinds is sold in the form of pulp by domestic mills. The larger part of the domestic production of sulphite pulp is also made in integrated establishments, but there is a substantial production for sale, particularly on the Pacific coast, and to a smaller extent also in the Northeastern and Lake States. A considerable export trade in sulphite has developed from the Pacific Coast. Most of the pulp sold by Pacific coast mills in domestic markets goes to converters in the eastern part of the United States.

In spite of the considerable sales of sulphite by domestic pulp mills, those paper mills which do not produce their own supplies of sulphite are dependent to a very large extent on imports. The same is true in much greater degree of sulphate and of ground wood; however, such non-integrated paper mills use relatively little ground wood.

The large and expanding kraft pulp industry in the South is conducted almost entirely in integrated pulp-paper establishments. The South ships little sulphate pulp to the Northeastern and North Central States but supplies them instead with large quantities of kraft wrapping paper and container board.

The competition of imported pulp with domestic pulp made for sale is more direct than with that pulp made for conversion in integrated pulp-paper mills, although imported pulp after conversion into paper, competes indirectly with the latter also. Direct competition is therefore most conspicuous with respect to sulphite pulp, particularly bleached sulphite; in other words, the sales of sulphite by Pacific coast mills and the smaller sales by mills in the Northeastern and Lake States are especially subject to competition from imports in the form of pulp.

The prices of all kinds of pulp in the United States fell sharply after 1929, recovered somewhat in 1933 and 1934 with the decline in the foreign exchange value of the dollar, weakened in 1935, and since the middle of 1936 have risen markedly. Present prices are higher than for many years.

The Commission's investigation discloses that costs of producing wood pulp are generally considerably lower in the Pacific Northwest than in the Northeastern or Lake States because of the much lower costs of pulpwood there. In the case of ground wood,

however, costs averaged little lower on the Pacific coast than in the Northeastern section of the country. In the South the costs of producing sulphate pulp are even lower than in the Pacific coast region, chiefly by reason of the extremely low prices of yellow pine pulpwood.

TABLE III—AVERAGE COSTS AT PRODUCING MILL OF UNBLEACHED SULPHITE, SULPHATE, AND MECHANICAL PULP IN SLUSH FORM, JANUARY-SEPTEMBER, 1935
(Per ton of 2,000 pounds)

	North-eastern region	Lake and Central region	Southern region	Pacific coast region
Sulphite—				
Wood	$20.30	$19.68	.....	$10.91
Conversion (net)	16.14	17.22	.....	14.78
Total	36.44	36.90	.....	25.69
Total including interest	38.86	39.41	.....	28.07
Sulphate—				
Wood	.....	14.89	$6.71	7.93
Conversion (net)	.....	19.31	14.64	15.26
Total	.....	34.20	21.35	23.19
Total including interest	.....	36.59	22.64	26.16
Ground wood—				
Wood	10.11	8.94	.....	6.39
Conversion (net)	8.27	12.27	.....	11.83
Total	18.38	21.21	.....	18.22
Total including interest	20.04	24.67	.....	20.61

The costs of production shown in Table III are exclusive of transportation on such pulp as is shipped to separate converting mills. On the part shipped as pulp or paper to Northeastern and North Central markets the advantages of lower costs of production in the Pacific Northwest and Southern regions are offset to some extent by transportation charges.

So far Southern pine has been used in large quantities only in making kraft pulp for the manufacture of brown wrapping papers, container board, and similar products. The rapid expansion of the Southern kraft industry has in part, though not entirely, taken care of the great increase in the demand for these products in the United States. With the expansion of the pulp industry now taking place in the South, the dependence of the Northeastern and Lake and Central States on imports of kraft pulp may be lessened, even although consumption continues to increase.

The Pacific coast may for some time continue to increase its shipments of sulphite pulp to the consuming regions of the East, but probably not enough to lessen greatly their dependence on imports of sulphite pulp and of paper made from sulphite and ground wood.

The situation with regard to white papers may be completely changed if a large production of pulp suitable for making such papers should develop in the South. Many people in the industry are of the opinion that Southern pine can be economically used for the production of white pulps.

If the large and fast-growing stands of Southern pine come to be used in this way, a great reduction in the imports of sulphite pulp and of newsprint paper may occur.

Box Makers to Meet in Cleveland

Alfred S. Andrews of The Great Lakes Box Company, Cleveland, is General Convention Chairman of the 20th annual convention of the National Paper Box Manufacturers' Association (headquarters Philadelphia) at Hotel Cleveland, Cleveland, May 22 to 25, 1938. For treasurer of the committee the Cleveland paper box manufacturers chose Samuel Grunsweig of the Apex Paper Box Company, Inc.

This is the fourth time since the organization was formed that the city of Cleveland was chosen for an annual meeting. All Cleveland paper box manufacturers have banded together in committee and will participate as hosts to the setup box manufacturers of the country. An attendance of about 400 is expected.

Committee Chairman Andrews announces the following committee appointments:

Entertainment Committee: M. J. Lustig, Chairman, Smith-Lustig Paper Box Manufacturing Company, Inc.; M. C. Badger, the Ohio Boxboard Company; H. L. Brainard, Apex Paper Box Company, Inc., and Morris Levy, the Atlas Paper Box Company.

Reception Committee: Fred Hashagen, Chairman, Gair Cleveland Containers, Inc.; George Traub, Traub Container Corporation; Thomas Hurley, Apex Paper Box Company, Inc., and George Swartzweldер, the Shelby Paper Box Company.

Program Committee: H. V. Bray, Chairman, the United Paper Box Manufacturing Company; Joseph H. Haas, the Atlas Paper Box Company; Sidney Smith, Smith-Lustig Paper Box Manufacturing Company, Inc., and A .W. Branditz, Friedman-Blau-Ferber Company.

Golf Committee: Guy C. Cartwright, Chairman, the Shelby Paper Box Company, Inc.; Walter Stone, the Euclid Paper Box Company, Inc., and Charles M. French, the Great Lakes Box Company.

Ladies' Committee: Mrs. Alfred S. Andrews, Chairman, Mrs. Henry J. Westerkamp, Assistant Chairman, Mrs. M. J. Lustig, Mrs. A. W. Branditz, Mrs. Samuel Grunzweig and Mrs. O. F. Liebner.

Reception Committee: Associate Membership: Chairman Harry J Westerkamp, The LaBoiteaux Company, Inc., Cleveland.

Reception-Entertainment Committee; National Paper Box Supplies Association: Chairman, O. F. Liebner, the Central Lithograph Company, Cleveland.

The president of the National Paper Box Manufacturers' Association is Allen K. Schleicher of the F. J. Schleicher Paper Box Company, St. Louis; Charles K. Shaw of the Shaw Paper Box Company, Pawtucket, R. I., is vice-president; William R. Kreeger, secretary and Harry Edwin Roden, convention manager.

Wisconsin Merchants Elects Officers

At a meeting of the Wisconsin Paper Merchants Association held at the Pfister Hotel, Milwaukee, Monday, December 6, the following officers were elected for the ensuing year: President, Harry Newton, American Paper Company, Milwaukee; Vice-President, C. W. Sawyer, Sawyer Paper Company, Neenah; Secretary, J. S. Addison, Service Paper Company, Racine; Treasurer, Reno Kurth, Paper Specialty Company, Wausaw.

The directors of the Wisconsin Paper Merchants Association include the above mentioned officers and past president, F. C. Boyce, Wisconsin Paper and Products Company, Milwaukee.

The association was fortunate in the privilege of hearing an address at the noon luncheon by Francis Dickey of the Statistical Department of the Investors Economic Service who spoke on the present trend of business.

Paper and Cordage Assn. Give Party

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., December 27, 1937.—The manifestation of a spirit of good will was epitomized in the Christmas party given by The Philadelphia Paper and Cordage Association to sixty of the neediest children recruited from the ranks of The Salvation Army, at the Adelphia Hotel on Christmas day. Over two hundred members of the Association, including wives, sweethearts and guests, set aside their responsibilities and joined in one big family with these lusty throated youngsters for a full afternoon of entertainment.

The Association's little guests were treated to a turkey dinner and a stage show, during which Santa in the person of Leonard Fitzgerald, greeted them and distributed toys and clothing, including a 10-lb. bag of oranges for each one. And if this were not a true manifestation of the Association's tribute, retiring president E. K. Lay presented Brigadier General Jennie Ward who is completing forty-five years' service with the Salvation Army with a purse, a token of esteem from the members of The Paper and Cordage Association, with definite instructions that it was for her own personal use.

Genial Joe Miller, vice-president of Garret-Buchanan, was inducted into office as president of the Association for the coming year, together with Fred Brower, Atlantic Gummed Products, as vice-president, T. W. Monteith, The J. E. Fricke Company, treasurer, and Jack Shinner, Acme Specialties Company, secretary.

Retiring president Lay, in his usual magnetic way, thanked all the members for the unstinted cooperation extended to him during the past year and urged a continuance of their splendid manifestation of service to his successor, Joe Miller.

Messrs. Miller, Brower, Monteith and Shinner expressed their pleasure in being elected officers of the Association for the coming year and pledged their whole-hearted support in continuing the outstanding record of this Association.

Empire State Paper Association Meets

A quarterly meeting of the Empire State Paper Association was held at the Rochester Club, Rochester, N. Y., Friday, December 10. President John V. McCarthy, J. & F. B. Garrett Company, presided at the morning session which was marked by an exceedingly practical and educational talk by George B. Gibson. Vice-President F. T. Jamison attended and spoke as representative of The National Paper Trade Association. Another guest was Martin Gascon of Hubbs & Howe Company, Cleveland.

In the afternoon, separate sessions were held of the Fine and Wrapping Divisions presided over by Vice-Presidents Cowan and Dilts respectively and devoted to commodity committee reports and discussions.

Scott Paper Co. To Expand Plant

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., December 27, 1937.—The Scott Paper Company, Chester, has purchased a tract owned by the Alpha Boat Club, which adjoins its factory buildings in Chester.

The new owners contemplate improving the land with buildings representing an investment of about $1,000,000. Extensive improvements have been carried on by the company for the last several years.

Robert Colville Dead

PHILADELPHIA, Pa., December 27, 1937.—Funeral services for Robert Colville, 53, vice president of the E. J. Spangler Company, envelope manufacturers, were held December 28, at 11 A. M. from 1924 Arch street. Burial was in West Laurel Hill Cemetery.

Mr. Colville resigned as secretary of the company early this year to become president of the Tension Envelope Company, New York, while it was in reorganization. He recently resigned that position and was returning to Philadelphia to resume association with the Spangler concern when he died of heart disease Thursday.

He was a member of the Union League.

Surviving are his widow, Mrs. Lottie Erickson Colville; two daughters, Virginia and Mrs. David Savage; three sisters, Jennie and Mrs. R. A. Stevenson and Mrs. B. M. Paul of Pittsburgh, and a brother, Alexander Colville, Jr., president of the E. J. Spangler Company.

Riegel Not To Build Now

A press dispatch from Washington, D. C., under date of December 27 says that: "Based on an affidavit by Benjamin D. Riegel, chairman of the board of the Riegel Paper Corporation of 342 Madison Avenue, New York, that his company could not obtain loans with which to accomplish a contemplated plant expansion in North Carolina, the Atlantic Coast Line Railroad asked the Interstate Commerce Commission today to grant an extension of time within which to build a spur to the proposed Riegel plant in North Carolina.

"The Commission has granted the railroad authority to build the spur provided work was started before January 1, and completed by March 31, 1938. In view of the financing problem of the paper company, the railroad requested an extension of time.

"Mr. Riegel said in his affidavit that his company bought 137,000 acres of second-growth woodlands in Columbus and Brunswick Counties, N. C., and a plant site of 1,200 acres."

Buys Interest in Worthy Paper Co.

PITTSFIELD, Mass., December 27, 1937.—Horace W. Davis, president of the Eaton Corporation, announced last week acquisition of a "substantial" but not a controlling interest in the Worthy Paper Company of Holyoke. The Holyoke mill now makes paper for the Eaton Company.

Under the new arrangement, the local concern will continue to buy paper from the Worthy company, and the latter, besides supplying paper here, will develop new lines. It will also continue to sell to other companies. Among its present accounts is the Limited Editions Club, a widely known organization featuring fine paper and typography. The Worthy company was the first to develop a satisfactory reproduction of a paper containing the water mark of the crest of George I, now being sold exclusively at Williamsburg, Va.

Corrosion Resisting Paint

"Pennpaint" is the title of a folder issued by the Pennsylvania Salt Manufacturing Company, of Philadelphia, Pa., describing the merits of a product prepared with a chlorinated rubber base, claimed to be resistant to moisture, weather and chemical attack.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, of Pulp and Paper Mills

General Construction News

East Providence, R. I.—Green Brothers Company, Inc., 35 Valley street, manufacturer of paper boxes and containers, has approved plans for new addition to plant, including improvements in present building, and will place work under way at once. New unit will be two-story and basement, about 38 x 80 feet, located on Valley street. Entire project is reported to cost close to $50,000, including equipment. The Dwight Seabury Company, 188 Main street, Pawtucket, R. I., is architect and engineer.

Chicago, Ill.—The Chippewa Paper Products Company, 355 West Ontario street, manufacturer of paper specialties, has leased a two-story building at 2637-59 Polk street, totaling about 50,000 square feet of floor space, and will improve and equip for new plant, expanding present capacity.

Middletown, Ohio—The Crystal Tissue Company, manufacturer of tissue, kraft and other paper stocks, has closed bids on general contract for new addition to power house at mill, recently referred to in these columns, and will place award for superstructure at early date. It will be one-story type, 39 x 56 feet, and 44 feet high. Work will be placed under way in January. Awards for equipment have been made, including a 2000-kw. turbo-generator unit of General Electric Company type. Walter I. Barrows, Reibold Building, Dayton, Ohio, is consulting engineer.

Philadelphia, Pa.—The United States Gypsum Company, 58th street and Schuylkill avenue, manufacturer of wall board, plaster board, building papers, etc., has plans maturing for new addition to local plant, to be two-story and basement, 20 x 175 feet, with one-story wing extension, 20 x 120 feet. It will be used primarily for storage and distributing services. It is reported to cost over $80,000, including equipment. Work is scheduled to be placed under way early in 1938. Main offices of company are at 300 West Adams street, Chicago, Ill.

St. Louis, Mo.—S. E. Mendelson, treasurer of the Missouri Paper Stock Company, of this city, writes as follows:—"We wish to call your attention to an article on page 38 of the December 16 issue of the PAPER TRADE JOURNAL in regards to a fire at a warehouse at 17th and Austins streets, St. Louis, Mo., erroneously stating that the stock belonged to the Missouri Paper Stock Company. The Missouri Paper Stock Company did not occupy the warehouse, did not own any of the paper stock, and was not connected in any way with this fire. A careless mistake of this kind has a bad reflection on our company. We ask that you immediately print an article in your paper correcting this error and clearing our name entirely."

Chicago, Ill.—Kor-gen Paper Company, commercial paper products, has leased space in building at 711 West Randolph street, totaling about 2800 square feet of floor space, and will occupy for local headquarters, including storage and distributing facilities.

Chester, Pa.—The Scott Paper Company, manufacturer of tissue paper stocks, has completed work on new addition to mill, in progress for a number of months past, and will place new equipment in service at once, increasing mill capacity by about 16 per cent. The installation includes a new paper-making machine, increasing such units at the mill to a total of seven. The new machine will operate on a 24-hour production schedule, four shifts a day, the same basis as now operative with the other machine units. As previously noted in these columns, the expansion program represent an investment of about $1,250,000, including buildings and equipment.

Cleveland, Ohio—The Industrial Rayon Corporation, West 98th street and Walford avenue, Cleveland, manufacturer of cellulose rayon products, has plans under way for a new mill for production of cut staple rayon, to be located either at plant now in course of erection at Painesville, Ohio, or at Covington, Va., where company operates another mill unit. New plant will consist of several one and multi-story buildings, equipped for an initial capacity of about 10,000,000 pounds of rayon per annum, and is reported to cost over $2,000,000, with machinery. Project will include a power house, pumping station, machine shop and other mechanical units. It is expected to proceed with erection in 1938. The new Painesville mill of company, noted, is scheduled for completion in June of 1938, and will represent an investment in excess of $3,000,000. Hiram S. Rivitz is president.

Hartsville, S. C.—The Sonoco Products Company, manufacturer of box board products, liners, chip board and kindred specialties, sustained a fire loss recently at local mill. Damage is reported as slight and will be replaced at early date.

Niagara Falls, N. Y.—The Celotex Corporation, 919 North Michigan avenue, Chicago, Ill., manufacturer of insulating board products, is concluding arrangements for purchase of a substantial interest in the Certain-teed Products Corporation, manufacturer of fiber board specialties, roofing products, etc., with mills at Niagara Falls and other points, and main offices at 100 East Forty-second street, New York, N. Y. The acquisition will total 9496 shares of pre-

ferred stock and 109,360 shares of common stock, and gives the Celotex Company a 20 per cent interest in the common stock of the Certain-teed Company. The latter company has a total of 45 plants and distributing branches throughout the country, and with a number of mills now idle, these will be used by the Celotex Company where deemed advisable for the production of its products, developing substantial increase in present capacity. The acquisition is scheduled for consummation in January.

Hamilton, Ohio—The Beckett Paper Company, manufacturer of bond and writing papers, card stocks, etc., has begun work on new addition to mill, recently referred to in these columns, to be two-story, estimated to cost close to $50,000, including equipment. F. K. Vaughn, Hamilton, has the general contract for erection. Mueller & Hair, Hamilton Bank Building, Hamilton, are architects.

North Wilbraham, Mass.—The Collins Manufacturing Company, manufacturer of bond, ledger and other writing papers, has plans in progress for a reorganization of company under Section 77-b of the Federal Bankruptcy Laws, for which a petition was filed recently in the Federal Court at Boston. It is proposed to continue mill operations without change and to continue with the same management.

Dolbeau, Que.—The Lake St. John Power and Paper Company, Ltd., manufacturer of newsprint, is operating on a full capacity schedule and will continue on this basis with full working quota for an indefinite period. Company has arranged a contract with the Newspaper & Magazine Paper Corporation, Eighth avenue and Fifty-seventh street, New York, N. Y., affiliated with the Hearst newspapers and periodicals, for 100,000 tons of newsprint annually for the next five years, dating from January 1, 1938, or practically the entire output of the company mill at Dolbeau, assuring maximum operations at this plant for such period of time. A. Stewart McNichols is president.

New Companies

Columbus, Ohio—The Scioto Paper Company has been organized with capital of 1000 shares of stock, no par value, to deal in paper products of various kinds. The incorporators include R. W. South, C. C. Hinterschied and A. J. Ulrich, 423 North Grant avenue, Columbus. Last noted is company representative.

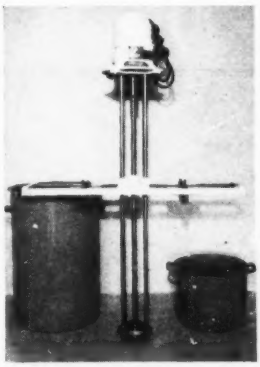
Chicago, Ill.—Package Specialties, Inc., 2532 Warren boulevard, has been incorporated with capital of 300 shares of stock, no par value, to manufacture and deal in paper boxes, cartons, bags and kindred paper containers. The incorporators include H. Klages, G. Nyedegger and F. Gerald O'Hara, 100 West Monroe street, Chicago. Last noted is company representative.

Wilmington, Del.—The Standard Bag Corporation has been chartered in Delaware under direction of the Corporation Trust Company, Industrial Trust Building, Wilmington, with capital of 1000 shares of stock, no par value, to manufacture and deal in paper bags and containers.

Dover, Del.—Stapled Fibres Products, Inc., has been incorporated in Delaware under direction of Fulda G. Donaldson, Dover, with capital of $10,000, to manufacture and deal in fiber products, paper specialties, etc. The incorporators include John C. Merrill and Wilbur G. Donaldson, Dover.

Mixing and Homogenizing Equipment

Homo-rod mixing and homogenizing equipment is explained in Catalogue No. 23, issued by Eppenbach, Inc., 45-10 Vernon boulevard, Long Island City, N. Y. The manufacturer states that the Eppenbach Homo-rod is a radical departure from the familiar marine type and other pre-mixing devices. Having no exposed moving parts, it consists of a motor, drive shaft and a turbine type homogenizing head. It is designed to fill the need for a light, vibration free portable mixer to efficiently homogenize and break down coarse particles without incorporating air in the mixture. The turbines are so arranged that the central revolving one draws the material up from the bottom of the tank and forces it under high pressure and with violent turbulence through the stationary turbine. The action is such that all the material in the tank continually passes through the homogenizing head. This is asserted to give the entire mix a complete homogenizing and insures efficient control of particle size.



The manufacturer states that the Homo-rod is designed to give an efficient capsulizing action, which prevents an emulsion from reverting. All emulsifying agents, such as casein, etc., can be homogenized and stretched so that the maximum efficiency relative to the capsulizing action of the agent can be obtained.

The Eppenbach Homo-rod is made in a variety of models, all of which are portable and can be moved from tank to tank. The larger units are stated to tend to break up clusters of fibers with a gentle beating action.

"Mathieson Chemicals"

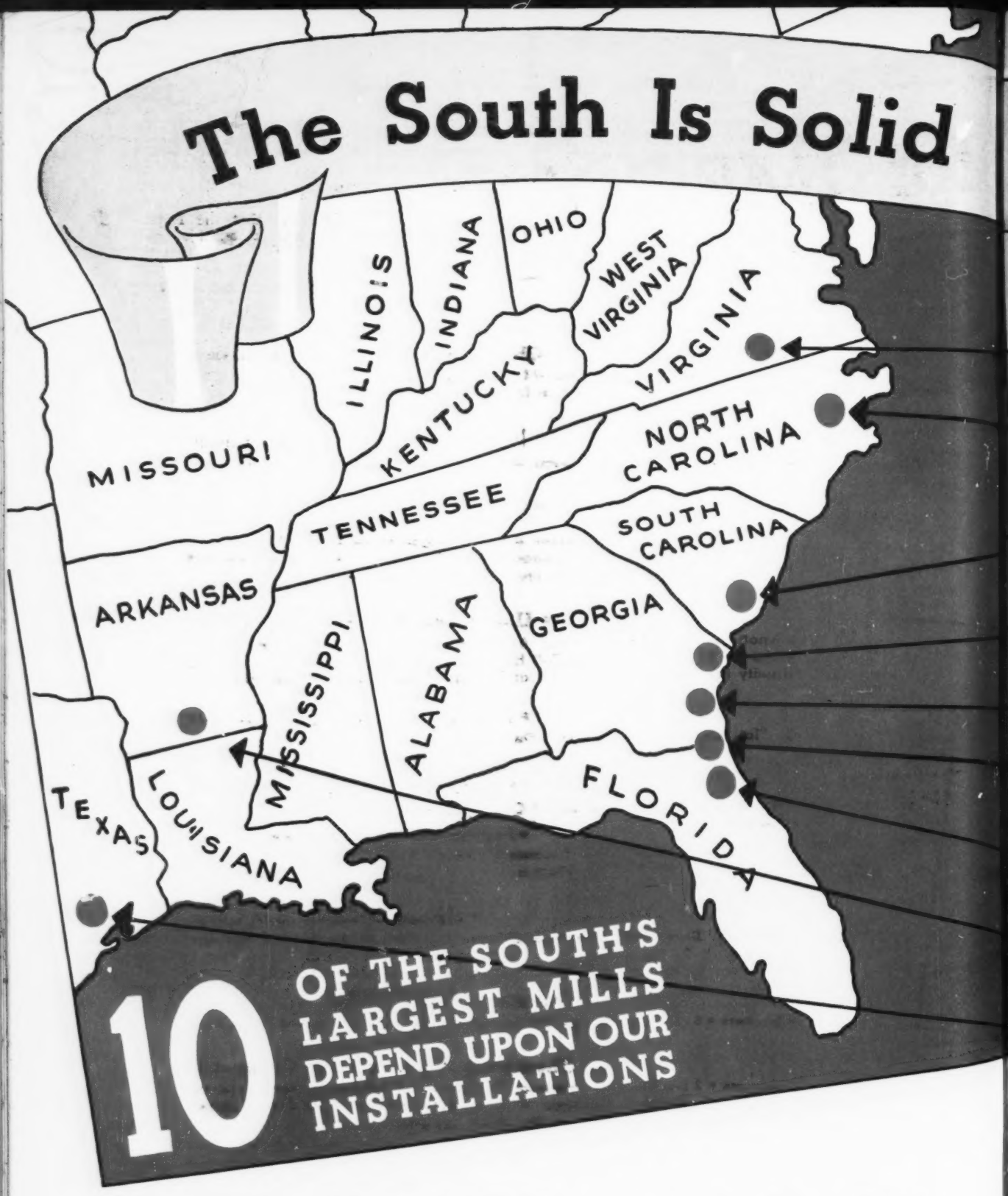
This booklet briefly traces the development of the Mathieson Company from its modest beginnings in 1895 to the present time. Flow charts outline the processing operations at the company's different plants, and a section devoted to the company's products gives the chemical buyer concise information and package specifications on a wide variety of products.

Of particular interest is the chart of "Users and Uses" of Mathieson Chemicals which the booklet presents. Eighty-one different industries which use one or more Mathieson products are listed. And the uses range all the way from poultry sanitation to rayon manufacture. The booklet is carefully laid out and contains a host of unusually fine photographs.

Any one interested in possessing a copy of "Mathieson Chemicals" may obtain one by writing to The Mathieson Alkali Works (Inc.), 60 East 42nd street, New York, N. Y., on his business letterhead.

New England Board Mills Close

BOSTON, Mass., December 27, 1937.—The majority of paper board mills in New England were closed last week for their annual vacation.



IMPROVED PAPER

NASHUA,

ROTARY AND FLAT SCREEN KNOTTERS • CENTRIFUGAL SCREENS • FLAT SCREENS WITH DUNBAR DRIVE (METAL AND CYPRESS VATS) • VACUUM FILTERS, INCLUDING SAVE-ALLS • WASHERS • HIGH DENSITY THICKENERS • LIME SLUDGE FILTERS • BLACK LIQUOR WASHERS • FORMING CYLINDERS

for 'IMPCO' Machinery

at **FRANKLIN** • **Chesapeake-Camp Corporation**
2 Knotters • 4 "IMPCO" Design #4 Centrifugal Screens • 1 Vacuum Thickener
1 Vacuum Save-all • 1 Vacuum Lime Sludge Filter

at **PLYMOUTH** • **Kieckhefer Container Corp.**
4 Knotters • 6 "IMPCO" Design #4 Centrifugal Screens • 2 Vacuum Lime Sludge Filters

at **CHARLESTON** • **West Virginia Pulp & Paper Co.**
4 Knotters • 6 "IMPCO" Design #4 Centrifugal Screens • 2 High Density Vacuum Thickeners • 3 Vacuum Lime Sludge Filters • 1 Three-Roll Hydraulic Wet Machine with vacuum high density thickening cylinder • 1 Refiner Thickener

at **SAVANNAH** • **Union Bag & Paper Corporation**
8 Knotters • 12 "IMPCO" Design #4 Centrifugal Screens • 6 Vacuum Thickeners • 1 Thickener • 1 Three-Roll Hydraulic Wet Machine with vacuum high density thickening cylinder • 5 Flat Screens—Cast Iron vats—Dunbar Drives

at **BRUNSWICK** • **Brunswick Pulp & Paper Co.**
24 Flat Screens • Bronze Vats • Dunbar Drives

at **FERNANDINA** • **Kraft Corporation of America**
3 Knotters • 4 "IMPCO" Design #4 Centrifugal Screens • 2 Vacuum Thickeners
1 Slusher
• **Fernandina Pulp & Paper Co.**
2 Rubber Covered Ka2 SMO Vacuum Thickeners • 3 Rubber Covered Vacuum Washers • 1 Two-Roll Wet Machine

at **JACKSONVILLE** • **National Container Corp.**
3 "IMPCO" Design #4 Centrifugal Screens • 1 Vacuum Decker • 3 Vacuum Washers

at **CROSSETT** • **Crossett Paper Mills**
4 Knotters • 6 "IMPCO" Design #4 Centrifugal Screens • 2 Vacuum Thickeners

at **HOUSTON** • **Champion Paper & Fibre Company**
3 Knotters • 2 Double Valve Vacuum Thickeners • 1 Rubber Covered Vacuum Washer • 1 Vacuum Thickener • 1 Vacuum Washer • 35 Flat Screens Bronze Vats • Dunbar Drive • Bleaching Equipment

MACHINERY CORPORATION
NEW HAMPSHIRE

MULTIPLE STAGE COUNTER-CURRENT PAPER STOCK WASHERS • DECKERS • WET MACHINES, INCLUDING HYDRAULIC WITH HIGH DENSITY VACUUM WET END • THORNE BLEACHING EQUIPMENT • PNEUMATIC WATER FILTERS • CYLINDER MOULDS • LABORATORY EQUIPMENT • SPECIAL MACHINERY

PAPER TRADE JOURNAL

ESTABLISHED 1872

Reg. U. S. Pat. Off.

George S. Macdonald, Pres. *Joseph P. Morgan, Secy.*

Executive and Editorial Offices, 15 West 47th St., New York, N. Y.

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Price, Per Copy, 10 Cents — United States, Per Annum, $4.00
Canada and Foreign Countries in Postal Union, $6.00

Member Audit Bureau of Circulations

Vol. CV New York, December 30, 1937 No. 27

COMING EVENTS IN THE PAPER INDUSTRY

AMERICAN PAPER AND PULP ASSOCIATION, Sixty-first Annual Convention and meeting, Waldorf-Astoria Hotel, New York. February 21-25.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Convention, Waldorf-Astoria Hotel, New York, February 21-24. Annual Luncheon, Waldorf-Astoria Hotel, Wednesday, February 23.

SALESMEN'S ASSOCIATION OF THE PAPER INDUSTRY, Annual Meeting and Luncheon, Waldorf-Astoria Hotel, New York, Tuesday, February 22.

NEW YORK ASSOCIATION OF DEALERS IN PAPER MILLS' SUPPLIES. Annual Banquet, Hotel Commodore, New York, February 23.

NATIONAL PAPER TRADE ASSOCIATION OF THE UNITED STATES, Convention, Waldorf-Astoria Hotel. New York. February 21-23.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Nonotuck Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION, Technical Association of the Pulp and Paper Industry— Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION, Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park,American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILLS SUPERINTENDENTS ASSOCIATION, Annual meeting, Royal York Hotel, Toronto, Ont., June 22-24.

PAPER EXPORTS SHOW GAIN

Exports of paper and paper manufactured articles gained 5 percent in October, as compared with the preceding month, reaching a value of $2,631,000, according to the Pulp and Paper Section, Forest Products Division, Department of Commerce. Imports, on the other hand, dropped slightly during the same period.

Boxboard exports marked a substantial gain of 52 percent, rising from 3,843,000 pounds in September to 5,842,000 in October. Fiber insulating board registered a like gain of 32 percent, reaching 6,569,000 square feet during October, compared with 4,984,000 for the previous month. This was a gain of 12 percent over the corresponding month last year. Wallboard jumped 88 percent from 806,000 to 1,516,000 square feet. This represents an increase of 118 percent over the same month last year. Exports of paper bags dropped 3 percent and all wrapping paper except kraft registered a 28 percent loss, from 2,774,000 to 2,000,000 pounds, while newsprint decreased 18 percent. Although overissue and old newspapers receded 31 percent, uncoated book paper gained 6 percent over September and 12 percent over the corresponding month last year. Sheathing and building paper registered the largest single gain in the major class, jumping 166 percent from 635,000 to 1,692,000 pounds.

Pulpwood exports for October rose 418 percent over September, from 807 to 4,178 cords. This was a gain of 516 percent over October last year. Wood pulp exports dropped 17 percent, but showed a gain of 62 percent over the same month last year.

Imports of paper base stocks for October dropped 2 percent from a value of $10,739,000 to $10,574,000 for September. All classes of wood pulp except sulphite showed gains ranging from 12 percent, to 1293 percent in the case of bleached mechanical pulp. Rags for paper stock gained 19 percent, greaseproof and waterproof paper dropped 46 percent, and kraft wrapping dropped 29 percent. Paperboard and pulpboard decreased 14 percent, while pulpboard in rolls rose 21 percent from 1,685,000 to 2,037,000 pounds. The decline of October imports, compared to September, in bleached sulphite, greaseproof and waterproof and kraft wrapping, also represents a decline as compared with October of last year. The drop in value of paper base stocks, however, for October of this year compared with September, represents a gain of 20 percent over the same month last year.

FUNCTIONS OF THE PERSONNEL DIRECTOR

Continuing emphasis on industrial relations problems and the development of sound personnel policies has prompted many companies to look more closely to the organization of their personnel departments. They are doing this with the realization that improper organization of the personnel function seriously handicaps the development and execution of an effectual personnel program. In view of the widespread interest in this problem, the Policyholders Service Bureau of the Metropolitan Life Insurance Company has recently issued a report entitled, "Functions of the Personnel Director" which is based on information obtained from 80 companies representing a wide variety of industrial and commercial enterprises, including paper.

The report indicates that the personnel function is two-fold. It consists, first, of giving service to the line organization in the maintenance of an efficient labor force and, second, of establishing good relations with employees. Regardless of the existence of an organized personnel department, every company finds it essential to hire new employees, place them at work for which they are adapted, transfer them to other departments to meet production requirements, and surround them with helpful and safe working conditions. Personnel Management thus has grown

both logically and historically out of the employment function. More recently, however, greater emphasis has been placed on the development of a cooperative attitude of mind by establishing good industrial relations throughout the organization.

The report outlines the personnel policies and programs of leading companies, describes the place of the personnel director in industry and business today, and indicates how personnel departments are organized. Particularly in the larger companies, sound policies, programs and organization methods are important, the report states, but points out further that the development of good industrial relations is basically a human problem. In order to create a spirit of cooperation, it is believed that management should know and have a better understanding of the individuals employed, treat them as associates, place them in positions where they can utilize and develop their abilities, and take an interest in their individual aspirations and development. Because there are conditions in every company that make for either good or bad industrial relations, the report concludes that these conditions should be studied and brought under managerial control.

Forestry Section To Meet at Atlanta

The final program for the Forestry Section meeting of the Association of Southern Agricultural Workers to be held February 2-4 at Atlanta, Ga., has been prepared by Mr. R. W. Graeber, Chairman of the Section.

The meeting will include a symposium on the "Pulp and Paper Industry in the South" to be held at 9. A. M. February 3. This will be as follows:

1. "Timber Farming—A New Agriculture"—Hon. Harry L. Brown, Assistant Secretary of Agriculture, Washington, D. C.

2. "The Pulp and Paper Industry in Relation to Forest Farming in the South"—Matt Rue, Brunswick Peninsula Company, Brunswick, Ga.

3. "Fitting Timber Farming Into the Farm Management Program"—Oscar Steanson, Bureau of Agricultural Economics, Division of Farm Management, Washington, D. C.

4. "Should Publicly Employed Foresters Discuss Timber Values and Prices in Meetings and with Timber Owners"—W. W. Henderson, North Carolina Pulp and Paper Company, Plymouth, N. C.

General Discussion: "How Can Pulp Mills Be Guaranteed a Permanent Supply of Timber?"—Directed by Gus H. Lentz, U. S. Forest Service, Atlanta, Ga.

Fire Damages Otsego Falls Mill

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., December 27, 1937.—Fire of an undetermined origin caused damage of $2,000.00 to the machine room of the Otsego Falls Paper Company located in Otsego, Mich. The plant had been closed down for several days undergoing repairs previous to the fire. The company is operated by the same management as that of the Prairie State Paper Mill at Joliet, Ill.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES

Months	1937	1936	1935	1934
January	90.3% (c)	76.1%	65.8%	
February	90.1% (c)	77.9%	70.0%	
March	90.3% (c)	76.0%	70.5%	
April	92.1% (c)	82.3%	70.0%	
May	90.6% (c)	81.6%	69.4%	
June	87.3% (c)	80.7%	72.3%	
July	81.8% (c)	77.3%	64.9%	
August	82.9% (c)	81.5%	70.9%	
September	78.6% (c)	80.5%	71.9%	58.2%
October	73.5% (c)	87.6%	75.6%	64.7%
November	61.2% (c)	88.0%	75.3%	61.7%
December		85.9%	71.2%	59.6%
YEAR AVERAGE		81.3%	70.5%	
YEAR TO DATE				
First 50 weeks..	82.1%	81.6%	70.7%	

COMPARATIVE WEEKLY SUMMARIES

Current Weeks, 1937		Corresponding Weeks, 1936	
*November 13	61.7%	November 14	87.6%
*November 20	62.0%	November 21	89.4%
*November 27	56.5%	November 28	87.9%
*December 4	59.3%	December 5	90.3%
*December 11	56.4%	December 12	93.3%
*December 18	56.1%	December 19	94.4%

The following statistics show the number of mills reporting by ratio groups:

NUMBER OF MILLS REPORTING, CURRENT WEEKS

Ratio Limits	Nov. 13 1937	Nov. 20 1937	Nov. 27 1937	Dec. 4 1937	Dec. 11 1937	Dec. 18 1937
0% to 50%	146	129	183	141	157	94
51% to 100%	173	186	124	166	146	106
Total Mills Reporting	319	315	307	307	303	200

* Subject to revision until all reports are received.
(c) Basic capacity data have been adjusted to correspond with ratings reported by individual companies.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours", were as follows:

Months	1937	1936	1935	1934
January	80% (e)	61%	61%	
February	86% (e)	67%	67%	
March	87% (e)	68%	67%	
April	89% (e)	70%	61%	
May	86% (e)	68%	61%	
June	75% (e)	68%	65%	
July	67% (e)	69%	59%	
August	74% (e)	75%	65%	
September	70% (e)	76%	69%	62%
October	66% (e)	82%	76%	63%
November	56% (e)	79%	70%	56%
December		74%	60%	52%
Week ending November 13, 1937				57%
Week ending November 20, 1937				56%
Week ending November 27, 1937				50%
Week ending December 4, 1937				50%
Week ending December 11, 1937				53%
Week ending December 18, 1937				51%

(e) Basic figures revised to include new members of the National Paperboard Assn.

To Cease Misleading Representations

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 29, 1937.—Reynolds Corporation, 19 Rector street, New York, dealer in an insulation device consisting of aluminum foil mounted on Kraft paper, has entered into a stipulation with the Federal Trade Commission to discontinue certain misleading representations in the sale of its product.

Among the representations to be discontinued are that radiation is responsible for 70 per cent of the heat loss from houses, or any other percentage, unless supported by competent authority, and that Reynolds Metallation will stop the passage of heat of any type in any amount or percentage, except such type and amount or percentage as has been established by competent factual evidence. Under the stipulation, Reynolds Metallation will not be advertised as impervious to the passage of heat or as resistant to fire, unless the latter assertion is limited to types found by competent scientific tests to be substantially fire resistant under normal conditions of use.

FASTER WAYS TO REACH

NEW MARKETS

THE ART OF

CASEIN MAKING

IS NOW A SCIENCE AT CYANAMID

Casein making was formerly an art in that the "feel" of the curd was one of the most important controls of quality.

Now, by the application of heat and pH control, together with modern equipment, Cyanamid has eliminated the guess-work and made possible the manufacture of more uniformly high quality Casein. Speed in processing is essential in securing this uniform high quality. At Cyanamid it is now a matter of minutes from milk to Casein bagged and ready for immediate shipment to your plant.

It is through the development of such methods that Cyanamid is helping its customers to do their jobs faster, more smoothly, with better results.

Cyanamid's comprehensive list of products for paper production, together with the cooperation of our experienced technical staff and the benefits of our speedy delivery system, will give you added confidence in the success of your production methods.

AMERICAN CYANAMID & CHEMICAL CORPORATION

30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

Section of the
Technical Association of the Pulp and Paper Industry
T.A.P.P.I.

Edited by Ronald G. Macdonald, Secretary

Structure Changes in Stock Preparation*

By the Staff of the Institute of Paper Chemistry[1]

One section of the program on fundamental research at the Institute of Paper Chemistry deals with the structure of paper making fibers and the changes occurring as a result of pulp and paper operations. Reports have already been presented before the Technical Association of the Pulp and Paper Industry dealing with the effect of processing on the swelling characteristics of paper making fibers, operations have been followed by means of the Cine Kodascope, and a large number of moving pictures have been taken which indicate rather clearly that there is a definite relationship between the swelling behavior of a fiber and the physical characteristics of that fiber.

A second stage of this fundamental problem dealt with the nature of the insoluble material remaining after cuprammonium hydroxide solution had been allowed to react with the well-cooked and bleached fiber. The results of this investigation, as recently reported, indicated that this material was largely carbohydrate in nature, although it contained a small amount of lignin. It is believed that this substance represents the material in the fiber which forms the limiting membrane in the balloon swelling with cuprammonium hydroxide.

The report presented at the Savannah meeting of the Technical Association covered three additional studies in this general field.

The first involved an investigation of the physical and chemical effect of extraction of pulp fibers with pectic solvents. Earlier work on the extraction of cotton cellulose with pectic solvents indicated that a material was removed thereby which changed markedly the behavior of cotton cellulose in cuprammonium hydroxide, and the conclusion was drawn that the viscosity of a cotton cellulose in cuprammonium hydroxide was due to the cementing material removed by the pectic solvents rather than to the viscosity of the cellulose cuprammonium complex itself.[1]

Because of the use of the viscosity of pulps in cuprammonium hydroxide in evaluating pulps, it seemed highly desirable to determine whether the viscosity of pulp fibers in cuprammonium hydroxide might be due to some cementing substance rather than to cellulose. Pulps were therefore extracted with pectic solvents, including 0.5 per cent ammonium oxalate, dilute acids, and dilute caustic. The amount of material extracted was determined, its nature investigated, and a study made of the physical and chemical characteristics of the extracted pulps. Solutions of these extracted pulps in cuprammonium hydroxide indicated the presence of a smaller amount of cuprammonium-insoluble material than from the original pulps. The cuprammonium-insoluble material in no case exceeded 2.8 per cent, and in most cases ran very much below this value. Upon analysis, the extract was shown to be largely carbohydrate material, the principal sugar after hydrolysis being glucose, with smaller amounts of galactose and pentosans, although a small amount of lignin was present in the extracted pulps. The pulps, with the exception of those extracted with acids, were analyzed and found to be practically identical to the original unextracted material, the only difference being a loss in pentosan and a slight lowering in copper number. The viscosity of the cuprammonium solutions of these pulps was only slightly below that of the original pulp, and tests made on blanks which had been treated with hot water or heated for the same period of time as was used with the extractions, showed the same falling off in viscosity. The extracted pulps also were shown to have very much the same strength characteristics as the unextracted ones. Hence, it was concluded that pectic solvents, with the exception of acids, have little effect on the viscosity characteristics of wood pulps. It was also concluded that wood pulps can be dispersed in cuprammonium hydroxide of the strength and under the conditions specified by the TAPPI Standard Method.

The second study reported dealt with the characteristics of highly lignified pulps. Five pulps were prepared from spruce ranging in lignin content from 22.2 per cent down to 8.6 per cent. The first pulp was obtained by a neutral sulphite cook, and the other four by a kraft cook of the pulp made in the sulphite cook. It was found that the fibers obtained from the first two cooks were still rather completely covered with middle lamellar lignin. In the third cook, in which the lignin content was 15.9 per cent, there were evidences of fibers in which the middle lamellar lignin was relatively low in amount. Such fibers showed occasional balloon swellings with cuprammonium hydroxide. In the fourth pulp the middle lamellar lignin was present in much smaller amounts, while in the fifth the balloon swelling with cuprammonium hydroxide was extremely common. Beater tests showed that the development of handsheet

* Presented by Harry F. Lewis at the fall meeting of the Technical Association of the Pulp and Paper Industry De Soto Hotel, Savannah, Ga., Oct. 18-21, 1937.

[1] Appleton, Wis.

Note: This paper is a brief summary of three papers to be published at a later date.

[1] Farr, W. K., Pulp Paper Mag. Can. 37: 74-8, especially 77-8 (1936); Proc. Tech. Sect. Can. Pulp & Paper Assoc.: 55-61, especially 59 (1936).

strength on beating increased very considerably as the lignin content decreased, the greatest increase in strength being observable between pulps four and five, particularly in the matter of burst and folding strength. It appears from this study that the development of strength in pulps is related to the removal of middle lamellar lignin; as the latter dissolves, a continually increasing area of cellulose is present in the outer wall of the fiber. This cellulose takes an active part in the beating operation.

The final study dealt with an investigation of the cooking and bleaching behavior of 20 micron-thick cross sections of spruce, pine, and poplar wood during sulphite, soda, and kraft cooks, and hypochlorite and chlorine bleaches. Because of the large amount of data accumulated, it was impossible to present this report in any other than fragmentary form, but it is hoped that it will be given in full at the February meeting of the Technical Association. Among the points mentioned in connection with this paper was the difference in mechanism of sulphite cooking, on the one hand, and the alkaline cooking, on the other, the sulphite cook showing simultaneous removal of secondary wall lignin along with the middle lamellar lignin, while the alkaline cooks appeared to dissolve preferentially the middle lamellar lignin, leaving the secondary wall lignin within the fiber until a large share of the middle lamellar lignin has been removed. This fact, it was brought out, may account for the difference in behavior of acid and alkaline cook fibers and may also account for the difficulties involved in bleaching of alkaline pulps.

These three studies were a part of the academic program of the Institute of Paper Chemistry during the past year. As such, they will be reported in full in the technical magazines.

Review Of The Paper Industry Literature

Abstracts Compiled By the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson and Clarence J. West, Chairman of the Committee.

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Paper Specialties

Process for the Manufacture of Artificial Leather. Blaupot Ten Cate B. G. Belg. pat. 417,-563 (Oct. 31, 1936).—A loose fibrous mass is treated with a small amount of an agglutinant, and is impregnated with a rubber solution or dispersion by passing between a pair of rolls and feeding the rubber at the nip of the press.—A.P.-C.

Roofing or Like Element. Otto A. Heppes and Lester K rschbraun, assignors to The Patent and Licensing Corp. U. S. pat. 2,071,229 (Feb. 16, 1937).—The invention provides a composition shingle of stepped or variable thickness, the butt portion being thickest and the upper end thinnest with intermediate areas of intermediate thicknesses defined by more or less pronounced shoulders.—A.P.-C.

Roofing Material. Robert T. Johnston, assignor to Bakelite Corp. U. S. pat. 2,060,083 (Nov. 10, 1936).—A base such as a felt base material is provided with a film comprising an oil such as tung or linseed oil and a synthetic resin with which mineral particles of various sizes are bonded to each other and to the base.—A.P.-C.

Constructional Material Suitable for Roofing. Albert C. Fischer, assignor to The Philip Carey Manufacturing Co. U. S. pat. 2,065,439 (Dec. 22, 1936).—A material such as a paper or felt, is saturated with a bituminous saturant, such as a bitumen-kerosene mixture, containing a solvent, and is coated with a slow-drying, tacky, bituminous composition, or treated with castor oil or the like.—A.P.-C.

Process and Apparatus for Producing Variegated Roofing. Benjamin S. Penley, assignor to The Barrett Co. U. S. pat. 2,068,761 (Jan. 26, 1937).—A number of sets of spaced wavy streams of granular material of contrasting color are simultaneously fed onto a continuously moving coated roofing web. The sets of streams are in different planes with the individual streams of one set staggered with respect to those of another set, and the aggregate width of the streams is such as to cover the entire width of the roofing web.—A.P.-C.

Process an Apparatus for Surfacing Roofing. John Robert, assignor to The Barrett Co. U. S. pat. 2,068,767 (Jan. 26, 1937).—A stream of granular material, preferably at least as wide as the web of coated roofing, is passed through a substantially vertical plane onto the web, the flow of the stream being intercepted along spaced points in its plane of flow by means of a number of spaced oscillating hollow members. Granules of a different color are fed through the hollow members or spouts on to the portions of the web left uncovered by the main stream.—A.P.-C.

Manufacture of Felted Prooted Fibrous Materials. Truman A. Pascoe and Roy P. Hella, assignors to Cellovis, Inc. U. S. pat. 2,069,771 (Feb. 9, 1937).—A sheet is formed of a furnish comprising wet-beaten stock, a soluble cellulose derivative and a plasticizer. The sheet may be coated on one or both sides with a solution of the plasticized cellulose derivative.—A.P.-C.

Paper Article and Method of Making the Same. George J. Manson, assignor of one-half to Nathaniel L. Foster. U. S. pat. 2,068,299 (Jan. 19, 1937).—Two or more plies of paper are cemented together by means of a light-colored adhesive consisting mainly of rosin to which is preferably added a small proportion of mineral and (or) glyceride oil. Trim and other waste portions can readily be reworked in the beater.—A.P.-C.

Manufacture of Partially Soluble Felted Fibrous Articles. W. Bartlett Jones, assignor to Cellovis, Inc., U. S. pat. 2,069,763 (Feb. 9, 1937).—A mixture of beaten wood pulp and nitrated wood cellulose is sheeted on a paper machine.—A.P.-C.

Apparatus for Producing Laminated Materials.

Kimberly Stuart, assignor to Garrett B. Linderman, Jr. U. S. pat. 2,068,893 (Jan. 26, 1937).—In the production of laminated material in which a layer of aluminum foil is interposed between two layers of paper, the three sheets (to which adhesive has been applied by appropriate means) are fed successively through two two-roll presses. Each press consists of a yielding roll in contact with one of relatively harder material, the rolls of the second press being softer than those of the first press. The softer roll of the second press is mounted so that it is adjustable about the periphery of the harder roll.—A.P.-C.

Distinctive Paper and Method of Making Same. Burgess W. Smith, assignor to The Todd Co., Inc. U. S. pat. 2,067,988 (Jan. 19, 1937).—Paper is immersed in a solution that permanently reduces the surface tension of the sizing to the desired extent (suitably, equal volumes of 10 per cent borax and 5 per trisodium phosphate solutions, to which is added 1 per cent of sodium lauryl sulphonate), and while wet suitable words or indicia are impressed on the paper. The words or indicia are invisible when the paper is dry, but are "developed" when the paper is wetted. Any printing subsequently applied to the paper is preferably made with a water-soluble ink.—A.P.-C.

Shelf Paper. Fred A. Conrad, assignor to American Lace Paper Co. U. S. pat. 2,067,233 (Jan. 12, 1937).—In order to prevent curling of the printed or embossed margin of shelf paper, a stiffening and waterproofing coating is applied to both sides of such margin. The back may suitably be coated with the following composition: lithopone 5 per cent, white cement 35 per cent, clay 5 per cent, coatex (a trademarked adhesive) 7 per cent, water 50 per cent; and the face with the following composition: lithopone 64 per cent, ghatti gum 2 per cent, gum arabic 6 per cent, color 3 per cent, water 25 per cent.—A.P.-C.

Blotting Paper Stock Advertizing Card and Process of Forming Same. Chauncey K. Miller. U. S. pat. 2,061,844 (Nov. 24, 1936).—A selected portion of the blotting paper is subjected to compression and its surface is sealed to render it of non-blotting character.—A.P.-C.

Making Pulp Rovings, Yarns, and Twines. John C. Sherman. U. S. pat. 2,072,138 (March 2, 1937).—Very thin ribbons (0.001 to 0.002 of an in.) of wet pulp are formed on a wire passing around vacuum forming cylinder mold, dewatered progressively by suitable means (e.g., by heating) while still on the wire, and rolled or twisted into rovings when their water-to-fiber ratio has been reduced to about 1:1.—A.P.-C.

Multilaterally Stretchable Creped Paper Product. William C. Kemp, assignor to The Paper Service Co. U. S. pat. 2,071,347 (Feb. 23, 1937).—The paper is first creped at an angle of about 45° to the longitudinal axis of the paper, and then is creped at angle of about 90° to the first set of crepings. Preferably, the web is caused to adhere to the creping roll by means of a thermoplastic substance.—A.P.-C.

Waterproofed Paper. James Reid. U. S. pat. 2,071,360 (Feb. 23, 1937).—A waterproofed sheet of paper which readily lends itself to the manufacture of corrugated board is produced by cementing two sheets of paper by an intervening layer of material of a bituminous nature but comprising a substantial percentage of stearine pitch.—A.P.-C.

Fabricated Vegetable Fibrous Material and Method of Making the Same. George H. Ellis, assignor to The Insulite Co. U. S. pat. 2,071,822 (Feb. 23, 1937).—Fabricated vegetable fibrous material is rendered toxic to insects and fungi (though non-poisonous to human beings) by incorporation therewith of chlorophenol compounds, suitably zinc tetrachlorophenate.—A.P.-C.

Manufacture of Transparent Films. George A. Richter, assignor to Brown Co. U. S. pat. 2,068,630 (Jan. 19, 1937).—The tear resistance of cellulose-derivative films is greatly improved by admixing therewith a comparatively small amount of a mechanically gelatinized or well hydrated cellulose pulp.—A.P.-C.

Molded Products From Cellulosic Material Such as Bagasse Fiber. Frederic H. Smyser, assignor to General Electric Co. U. S. pat. 2,056,810 (Oct. 6, 1936).—Cellulosic material containing natural substances capable of yielding resinous compounds is digested with an alkali solution (such as a 1 per cent caustic soda solution) of such concentration and temperature and for such a time that the alkali is neutralized and an acid reaction to litmus is obtained and there is caused to precipitate around and on the fibers resinous and resin-forming substances; the solid constituents are separated, washed and dried, a synthetic resin is added and the mixture is molded under heat and pressure.—A.P.-C.

Shingle. Milton R. Beasley, assignor to Bird & Son, Inc. U. S. pat. 2,070,571 (Feb. 16, 1937).—An ornamental shingle is formed of an asphalt-saturated felt base on one side of which are applied successively a coating of asphalt, a layer of mineral surfacing, a second layer of asphalt and second layer of mineral surfacing; and there is impressed a shallow design or pattern so as to closely resemble the grain of wooden shingles.—A.P.-C.

Composite Flooring Material. Harold C. Harvey, assignor to The Agasote Millboard Co. U. S. pat. 2,069,720 (Feb. 2, 1937).—A soft porous pulp board is dipped into a hot oxidizable oil so as to impregnate the surface of the board to the desired extent, and is then baked to oxidize the oil and harden the impregnated surfaces. A thin sheet of rubber (preferably ribbed) or linoleum is secured to one side of the treated board.—A.P.-C.

Constructional Material. Albert C. Fischer, assignor to The Philip Carey Manufacturing Co. U. S. pat. 2,067,707 (Jan. 12, 1937).—A mixture of fibrous filling material, dense waterproofing mastic and a slow-drying lasting adhesive sticky to the touch, is molded into sheet form.—A.P.-C.

Boards

Splitting of Boards. H. Postl. Pappen- u. Holzstoff-Ztg. 44, No. 7: 74-75 (Feb. 12, 1937).—Splitting takes place when the individual layers of the board do not felt sufficiently with each other during manufacture. This trouble occurs chiefly with thick products prepared upon cylinder machines; thin boards and those manufactured upon Fourdrinier machines are less liable to split. Operating hints are given with regard to treatment of different raw materials, pressing and drying for minimizing the splitting tendency.—C.J.W.

Manufacture of Cylindrical Cardboard Cores. Papier-Ztg. 62, No. 15: 222, 224, 226, 228 (Feb. 20, 1937).—Different types of machinery for manufacturing cylindrical cardboard cores are described.—

Container Board. H. Postl. Pappen- u. Holzstoff-Ztg. 44, No. 2: 22-23; No. 3: 31-32 (Jan. 8, 15, 1937). The article gives a detailed description of the manufacture of container board, including raw materials, directions for the use of the cylinder and Fourdrinier machine, and drying, couching, and laminating operations.—C.J.W.

Explanation of Enormous Growth in Corrugated Production. J. D. Malcolmson. Fibre Containers 22, No. 2: 10-13 (Feb., 1937).—The phenomenal growth of the paperboard industry, especially during the period of the depression, is traced back to the application of intensive research and sales promotion. The container industry is continually looking for new outlets, the corrugated floor display stand being listed as one of the latest examples of this type. Directions are given for the successful application of this stand. —C.J.W.

First Soviet Mill for Production af Dielectric Fibreboard. B. A. Neimark, B. N. Moiseev and B. S. Liftman. Bumazhnaya Prom. 15, No. 9: 37-47 (Sept., 1936); C. A. 31: 2429. The layout, installation and the methods of production of various types of fibreboard for electrical insulation are described. —C.J.W.

Production of Fibreboard from Waste Tanbark Oak. L. A. Skul'skaya and S. P. Khvatt. Bumazhnaya Prom. 15, No. 10: 38-44 (Oct., 1936); C. A. 31: 2429.—Waste tanbark oak cooked with 10 per cent lime at 90-100 deg. C. for 6 hours in mixture with waste paper up to 30 per cent or unbleached sulphate pulp up to 20 per cent gave fiberboard comparable in the mechanical properties with 100 per cent waste tanbark oak product obtained by pulping with 30 per cent recovered lye at 6 atmospheres for 12 hours.—C.J.W.

Paper Manufacture. Thomas R. LeCompte, assignor to John A. Manning Paper Co., Inc. U. S. pat. 2,069,766 (Feb. 9, 1937).—Up to 2 per cent of gum karaya, which has been treated with a mild alkali such as ammonia to partially or totally deacetylate it, is added to the furnish, and is claimed to produce better and more uniform formation.—A.P.-C.

Method of Finishing Composite Paper Sheet Material. George E. Gibbs, assignor to American Reenforced Paper Co. U. S. pat. 2,069,063 (Jan. 26, 1937).—Two layers of paper are secured together by a heated thermoplastic material (e.g., bitumen) either with or without interposition of reenforcing filaments. A moistening liquid is applied to one of the paper sheets, and the composite sheet is wound into a roll so that the added moisture becomes uniformly distributed through out both paper plies.—A.P.-C.

Multi-Ply Construction Material Suitable for Sound Insulation. Charles A. Upson, assignor to The Upson Co. U. S. pat. 2,064,327 (Dec. 15, 1936).—A layer of strong and relatively rigid fibreboard is used together with layers of felt paper and cotton batting.—A.P.-C.

Construction Material. Charles A. Upson, assignor to The Upson Co. U. S. pat. 2,063,964 (Dec. 15, 1936).—Construction material for automobile tops and the like comprises a closely matted, porous, relatively tough, separately formed fibrous panel having a substantial degree of sound deadening, toughness, rigidity and resilience; and a separately formed facing ply permanently secured to the panel throughout substantially the entire common area of the two plies, the second ply being of weather-resisting sheet material treated to render it substantially impervious to water.—A.P.-C.

Composition of Matter and Method of Making the Same. Thomas Robinson, assignor to Lancaster Processes, Inc. U. S. pat. 2,072,686 (March 2, 1937).—Wood chips are fed together with a relatively small amount of water to an internal mixer such as the Banbury mier. When the wood has been reduced to the form of coarse fibers a bituminous binder is gradually fed into the mixing chamber, either in fluent form or as a solid, the amount being about equal in weight to that of the wood, and mixing is continued until the coarse fibrous material is reduced substantially to single fibers.—A.P.-C.

Flexible Veneers with an Enamel-Like Surface. John F. Dreyer, assignor to The Formica Insulation Co. U. S. pat. 2,062,088 (Nov. 24, 1936).—A thin sheet impregnated with a urea-formaldehyde resin is superposed on a thin sheet impregnated with phenol-formaldehyde resin, which in turn is superposed upon a sheet impregnated with polymerized vinyl chloride and the materials are united by heat and pressure.—A.P.-C.

Method of Making Artificial Lumber. James V. Nevin. U. S. pat. 2,068,926 (Jan. 26, 1937.)—This is an improvement on U. S. pat. 1,899,768 of Feb. 28, 1933. Waste wood is disintegrated in a wet state. A water-soluble, partial condensation product (suitably of formaldehyde and cresylic acid) is distributed uniformly throughout the mass so as to impregnate the fibers. A precipitating agent is added, the fibers are felted into a sheet which, after removal of as much water as possible by mechanical means, is subjected to heat and pressure to convert the condensation product into a resin.—A.P.-C.

Identifiable Carton Board. Charles C. Colbert and Lloyd C. Daly, assignors to American Coating Mills. U. S. pat. 2,071,025 (Feb. 16, 1937).—A multiply board is built up of differently colored plies or laminations and white liners, at least one of which is preferably coated with clay.—A.P.-C.

Pressed Board. Manvel C. Dailey, assignor to Canadian Gypsum Co., Ltd. Can. pat. 363,160 (Jan. 5, 1937).—A light porous sheet of lignocellulose fiber containing the natural fiber incrustation is dried and then heated under pressure at about 400° to 500° F. but below the point where active development of free carbon occurs.—A.P.-C.

Consolidated Cellulosic Product. Harry K. Linzell and Joseph W. Gill, assignors to Canadian Gypsum Co., Ltd. Can. pat. 363,161 (Jan. 5, 1937).—A hard dense artificial board is prepared by comminuting wood into fibers, assembling into a loosely coherent mass, heating to at least 400° F., applying for 2 to 3 min. pressure of about 400 lb. per sq. in., releasing the pressure, reapplying a pressure of about 800 lb. per sq. in., releasing, and reapplying pressure at about 1200 lb. per sq. in., releasing the pressure and cooling the board by an air blast.—A.P.-C.

Process for the Manufacture of Insulation Boards from Wood Fibers. A. Bol. Mo & Domsjo Wallboard Co., Sweden. Nor. pat. 57,406 (March 8, 1933).—Distribution of fibers of different degrees of beating from the de-fibering machines.—J.F.O.

Concerning Impregnating Materials for Board and their Uses. Fritz Ohl. Wochbl. Papierfabr. 68, No. 9: 156-58 (Feb. 27, 1937).—The author dis-

cusses certain facts concerning paraffine, latex, acetyl cellulose, sulphoacetate, chlorinated rubber, sodium and potassium water glass and ethyl silicate; all in conjunction with uses as impregnating materials.—J.F.O.

Machinery

Cleaning of Screens and Wires. Pappen- u. Holzstoff-Ztg. 44, No. 5: 55 (Jan. 29, 1937).—The article gives directions for the cleaning of screens and wires which have become soiled and plugged up with different kinds of impurities. Lubricating oils and grease are removed with kerosene, benzine, or turpentine and a brush; rubber particles can be melted with a painter's lamp, great care being taken that the flame is not too hot or directed towards the same spot for too long a time. Pitch is best removed with brush and turpentine; asbestos with a painter's lamp. In some cases souring the wire with dilute hydrochloric acid is the only remedy; the acid should be applied with great care, followed by thorough rinsing with large water quantities. Directions are also given for preventing impurities from getting into the stock.—C.J.W.

Efficient Calender Drive. E. Erichsen. Papir-J. 25, No. 3: 25-29 (Feb. 15, 1937).—The advantages of the three-phase shunt motor for driving calenders are pointed out.—C.J.W.

Cutters for Paper and Other Sheeted Material. Papier-Ztg. 61, No. 90: 1684, 1686, 1688, 1690-1691 (Nov. 7, 1936); 62, No. 15: 232, 234-235, 238, 240 (Feb. 20, 1937).—The article is a detailed study of various types of cutters for cutting and trimming sheeted material in piles.—C.J.W.

The Fibers Going to the Settling Tanks and their Movements. Finnish Paper and Timber J. 18, No. 22: 1084, 1086, 1088, 1090 (Nov. 30, 1936).—The author has made a thorough study of the distribution and movement of fibers in the white water system of a mechanical pulp mill. Greatest efficiency is obtained by the use of a large settling tank in which the rate of flow is as low as possible.—C. J. W.

New Method for Screening Chips. Nils Sundstedt. Svensk Pappers-Tidn. 40, No. 3: 56-57 (Feb. 15, 1937).—A new installation for screening chips is briefly described. It consists of a number of revolving rolls over which the chips travel. High quality chips are regular in shape and pass between the rolls to a bin underneath. Chips from compression wood and those containing knots are irregular in shape and larger in size; they travel across the rolls and are discharged at the other end. Mill experiments have shown that pulp from accepted chips only was practically free from knots and that no rejects were separated at the knotters.—C.J.W.

Removal of Trash or Impurities from Paper Stock. Homer D. Martindale, assignor to The Black-Clawson Co. U. S. pat. 2,070,742 (Feb. 16, 1937).—Stock leaving a continuous breaker beater is put through a long horizontal settling trough. At a considerable distance from either end of the trough it is provided with a deepened and widened portion, forming a transverse channel, into which the impurities settling out of the stock are carried by means of blades which slowly scrape the bottom of the trough. A suitable system of buckets carried on an endless conveyor continuously removed the impurities as they collect in the transverse channel.—A.P.-C.

Apparatus for Discharging Filters. Frank W. Young, assignor to Oliver United Filters, Inc. U. S. pat. 2,979,074 (Feb. 9, 1937).—A current of air is made to pass inwardly through the filter medium in advance of the point of discharge and then reflected, by means located beneath the filter medium, upwardly there through against the lower surface of the advancing cake. Means are provided whereby the cake, after being dislodged from the filter medium, is air-floated over the surface of a modified doctor or scraper.—A.P.-C.

Influence of the Solid on the Flow Properties of Dilute Suspensions. R. N. Traxler. Paper Trade J. 104, No. 8: 151-154 (Feb. 25, 1937).—The various types of flow encountered in dispersed systems containing various concentrations of solid are discussed, and the instruments available for evaluating flow properties in such systems are mentioned. A simple relationship is established between concentration of the solid present and the viscosity of the suspension, which relationship makes possible an accurate evaluation of the influence of a dispersed solid on the flow properties of slurries of which it is a part.—A.P.-C.

Process and Apparatus for the Manufacture of Filled Paper. A. E. H. Fair. Fr. pat. 804,238.—A filler suspension is sprayed in a finely divided state against an inclined baffle and is flowed therefrom by gravity on to the top of the paper sheet at a suitable point of the fourdrinier wire.—A.P.-C.

An Accurate Method of Measuring Speed Differences Between Paper Machine Sections. Arthur A. Scott. Pulp Paper Mag. Can. 38: 163-167 (1937).—A description of a method of obtaining accurate measurements of the sheet stretch or draw between successive sections of a paper machine; it is based on the use of a stroboscopic device whereby the speed differences are measured directly, and not by obtaining the difference between two measurements. The method was used to determine the amount of slipping which occurred between the wire and the couch roll, and also to establish a relation between the draw and the position of the cone-pulley belt.—A. P.-C.

Tension Controlling Means. Herbert L. Dyer, Jr., assignor to Hammermill Paper Co. U. S. pat. 2,067,755 (Jan. 12, 1937).—In order to keep the tension of a web of paper constant, there is mounted between two consecutive drying cylinders a tiltable frame including two rolls which engage opposite sides of the web. The construction is such that any change in the drying action, resulting in an increase or decrease in the tension of the web, is automatically compensated by making the web wrap around a smaller or larger portion of the surface of the drying cylinder.—A.P.-C.

Wire-Vibrating Means for Paper Machines. Edward W. Smith, assignor to Submarine Signal Co. U. S. pats. 2,070,757 and 2,070,929 (Feb. 16, 1937).—*No. 2,070,757*—The invention is based on the use of two masses which are coupled together through an elastic element or means providing a restoring force. Energy is supplied either between the two masses or to one of them from which the energy is transferred to the other by the elastic force in accordance with the principle of coupled masses. In the present system, the roll is made a part of one of the masses. There may be produced both a transverse vibration of the roll itself and a vibration of the roll in the direction of rotation of the roll and opposite thereto. *No. 2,070,929*—provides a modified embodiment of the same principle, which can be applied to existing machines with less change and a lower cost.—A.P.-C.

Instrumentation Studies. XXII

A Study of Photoelectric Instruments for the Measurement of Color: Reflectance and Transmittance

Part III: The Lange Photoelectric Reflection Meter

By The Staff of The Institute of Paper Chemistry

INTRODUCTION

The specific uses to which the Lange Reflection Meter can be put are only meagerly described by the descriptive material issued by Pfaltz and Bauer, Inc., the distributors of the instrument. It is stated that the instrument is "for the measurement of solids, powders, etc." The sheet of instructions which accompanied the instrument added:

"After steadying the meter at 100 with the Photo-Electric Cell on the Magnesium Block, transfer the cell to the sample to be measured and the meter will give an immediate reading of the percentage of whiteness of the sample as compared to the Magnesium Block."

The study of this instrument is reported in the same general topical order as that used in Section IV, Part I (Instrumentation Studies. XX)[1]. In order to save much repetition, the reader will frequently be referred to Part I, a copy of which should, therefore, be at hand.

Only one instrument (No. 034) was studied, but the discussion is applicable to, and data (except that on linearity) should be typical of, all instruments of the same model.

SECTION I

Description of the Instrument and the Method of its Operation

The instrument is an entirely self-contained unit, as the storage battery supplying current for the light source is carried in the cabinet with the meter and photocell-light-source unit. The photocell is an annularly shaped Lange blocking-layer photocell. The lamp, which is similar to a flash-light lamp, is mounted behind the photocell surface and a metal housing appropriately encloses both lamp and photocell. The photocell-lamp unit is placed on the sample surface. The photocell surface is held a fixed distance from the sample surface by a metal ring. Light from the lamp passes through the hole in the photocell in a diverging beam, strikes the sample, and is reflected. Part of the reflected light is received by the photocell. The photocell-lamp unit is connected to the cabinet by a short cable. The meter which indicates the photo-current has a non-linearly divided scale, graduated from 0 to 100. The sensitivity of the meter is controlled by coarse and fine potentiometer rheostats which shunt it. A rheostat in the lamp circuit permits adjustment of the lamp voltage to the desired value, which is read by a voltmeter in the cabinet. Several molded cells are supplied to hold powders. There are four filters: blue, yellow, green, and red. A schematic diagram of the lamp and photocell unit is shown in Fig. 1.

The operation of the instrument may be described as follows. The lamp is turned on and the voltage drop across its terminals is set at the desired value, between 3.5 and 4.0 volts. The lamp and housing are allowed to warm up for fifteen minutes before readings are taken. The photocell-lamp unit is placed on a freshly-surfaced block of magnesium carbonate and the meter is adjusted, by means of its sensitivity controls, to read 100. The unit is removed and placed on the sample, when its reading is taken as the reflectance of the sample for the unfiltered light. When a filter is used, it is placed on the magnesium carbonate block, the photocell-lamp unit is placed on the filter, and the meter is set at the highest possible value, which is less than 100 for all but the yellow filter. The filter is then put on the sample, and the unit is placed on the filter. The meter reading for the sample, divided by the meter reading for the magnesium carbonate, gives the reflectance of the sample relative to magnesium carbonate for the particular filter.

SECTION II

Spectral Characteristics of the Instrument

The intensity of the lamp was satisfactory for the measurement of "white" reflectances, i.e., the reflectances with no filter. When filters were used, the intensity was inadequate. With the maximum permissible voltage across the lamp, 4.0 volts, the maximum reading for the red filter on a magnesium carbonate block was 82.6. The maximum reading for the blue filter on the carbonate block was 39.0.

The lamp must always be operated at the same voltage, if readings are to be compared from time to time. A change in lamp voltage causes a change in the temperature of the lamp filament and, therefore, a change in the spectral energy distribution of the light striking the sample. A change of voltage from 3.51 to 3.78 volts caused an average change in the reflectances of thirteen "white" samples of 1.7 per cent.

When the lamp is operated at voltages near the

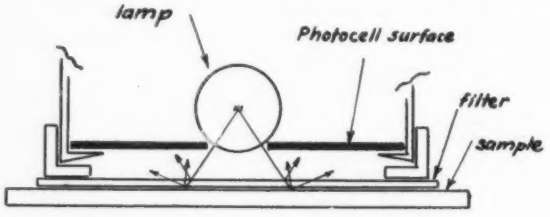


FIG. 1.

[1] Paper Trade J. 105, no. 19: 27-39 (Nov. 4, 1937).

maximum permissible value, the lamp ages noticeably during the course of four hours, due to deposition of absorbing material on the lamp envelope. This absorbing material alters the spectral energy distribution of the light.

It is known that a lamp of this type emits the greater portion of its radiated energy in the infra-red region of the spectrum, yet no provision was made for the elimination of the infra-red light from the light incident on the sample. The presence of this infra-red radiation is a serious source of error (*see* division (S4) of Section IV, Part I, in *all* readings made with the instrument, whether or not chromatic filters are used, because the photocell is sensitive to wave lengths at least as long as 780 millimicrons (according to descriptive material on Lange photocells), and the filters transmit appreciable amounts of infra-red energy, as is suggested by the curves of Fig. 2, and as will be shown by data to be presented later.

The existence of an appreciable error in the "white" reflectances measured by the instrument can be inferred directly from the known high relative energy of the infra-red output of incandescent lamps and from the spectral response of the photocell in the infra-red, the combination of which means that the "white" reflectances are not only reflectances averaged over the entire visible spectrum, but that they are reflectances averaged over the spectrum from somewhat less than 400 millimicrons to at least 780 millimicrons. This weighting of the wave lengths outside of the visible spectrum makes impossible any correlation between observed reflectances and either visual estimates of reflectance, or of "brightness." This fact is illustrated by the curves of Figs. 3 and 4. These curves are spectrophotometric curves obtained on the General Electric Recording Spectrophotometer (S2-G2-P2). They give the spectral reflectances, relative to magnesium carbonate, of thirteen samples of "white" paper. The numbered horizontal lines, marked, "Direct readings, Lange P.R.M.", and connected by arrows to the appropriately numbered curves, indicate the reflectances as read directly from the scale of the instrument with unfiltered, i.e., "white," light. These reflectances are indicated by lines rather than by points in order to emphasize the fact that they can be ascribed to no effective wave length. The similarly numbered horizontal lines, marked, "Readings corrected for linearity," are the effective reflectances after the directly observed values were corrected for non-linearity of the photocell response (this non-linearity will be discussed in Section IV). The direct readings have less meaning than the corrected ones and were included merely to emphasize the order of magnitude of the errors that may appear when a non-linear photometric device is used. It is important for the reader to notice that the corrected reflectances clearly indicate that the instrument fails to recognize the actual spectral reflectances of the samples through the greater part of the visible spectrum. Table I lists the shortest wave length at which the spectral reflectance curve of each sample reaches the value given by the corrected instrument

TABLE I

Sample No.	Shortest wave length at which spectral reflectance curve reaches the corrected instrument reading.
1	infra-red
3	infra-red
4	infra-red
5	672 millimicrons
6	672 millimicrons
7	infra-red
8	662 millimicrons
9	636 millimicrons
10	658 millimicrons
11	696 millimicrons
12	667 millimicrons
12G	655 millimicrons
13	664 millimicrons

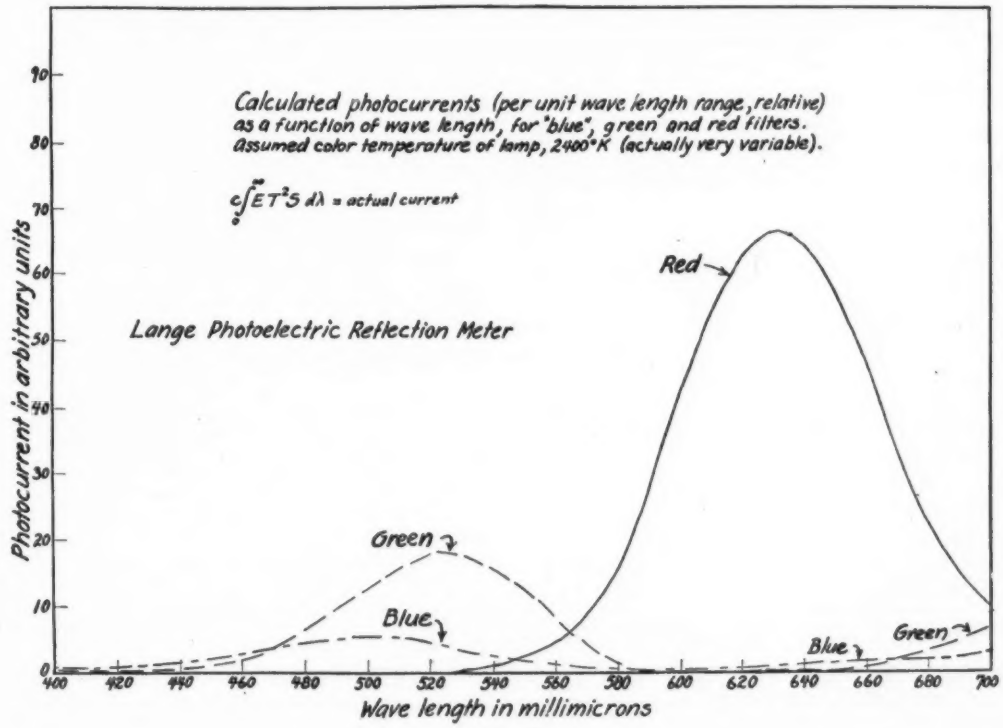


FIG. 2.

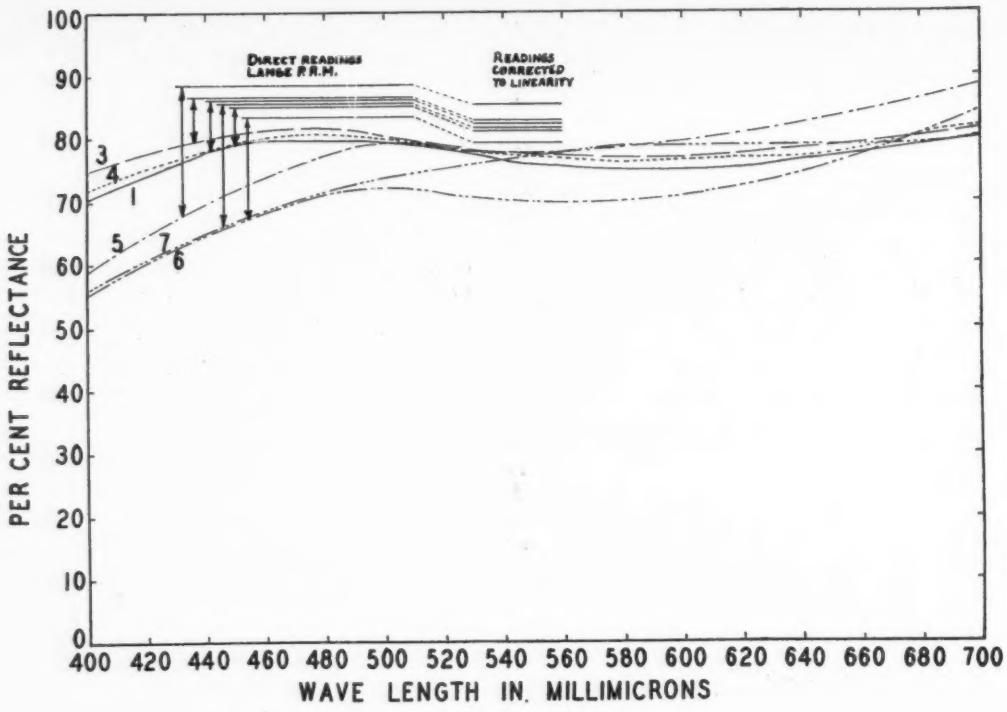


FIG. 3.

Spectrophotometric curves, and direct and corrected data obtained on the Lange Photoelectric Reflection Meter, for "white" paper samples (unfiltered light). Magnesium carbonate, 100 per cent.

readings. It should be noted that for four samples (Nos. 1, 3, 4, and 7), the spectral reflectance curves do not reach the value obtained from the instrument at any point in the visible spectrum.

No information concerning the transmittances of the filters was supplied with the instrument. The fact that the filters were supplied, however, implied that the instrument was intended to measure reflectances for the spectral ranges isolated by the filters. Spectral transmittance curves of the filters were obtained with the General Electric Recording Spectrophotometer. Since, in the Lange photocell-lamp unit, the light passes through the filter twice, once on the way to the sample, and once on the way from the sample to the photocell, the effective transmittance of each filter is approximately the square of the transmittance for a single passage through the filter. A color temperature of 2,400 degrees Kelvin was *assumed* for the lamp[2], which, with the observed transmittances of the filters and the average spectral response curve of a Lange photocell (from the commercial literature on Lange photocells), permitted the calculation of the relative photocurrents, for monochromatic light, as a function of the wave length, i.e., the calculation ET^2S as a function of the wave length. These calculations were carried out for the red, green, and blue filters. The resulting curves are shown in Fig. 2. It is seen that the blue filter has a *remarkably* long effective wave length (actually in the green) and that all three filters show an appreciable transmittance in the near infra-red.

The extent of this infra-red transmittance is shown more directly by the following data. The photocell was covered with a No. 88 Wratten filter. This filter had a transmittance of less than 0.1 per cent at 680 millimicrons, of about 5 per cent at 700 millimicrons, of about 50 per cent at 730 millimicrons, and was still increasing steadily in transmittance at 900 millimicrons. An external light source was adjusted to give a meter reading of 100. With this arrangement, the interposition of a Jena BG-18 filter (which transmits practically no near infra-red light beyond 690 millimicrons) between the light source and the Wratten filter reduced the meter reading to 1. With the Jena filter removed and the meter again reading 100, the red, green, and blue filters were successively interposed between the light and the Wratten filter. The readings thus obtained were, respectively, 94, 91, and 77.5. In other words, the transmittances of the three filters to the infra-red wave lengths between (roughly) 690 and 780 millimicrons (or the limit of sensitivity of the photocell) were 94, 91, and 77.5 per cent for the red, green, and blue filters, respectively.

Despite the fact that the ratio of the photocell response due to infra-red light to that due to visible light is unknown, the relative transparency of the filters to infra-red light destroys the significance of their apparent effective wave lengths as indicated in Fig. 2. It is to be expected, therefore, that the observed reflectances measured with these filters will show little correlation with the spectral reflectance curves of the same samples. This is shown to be the fact for the three samples (a red, a green, and a pink), whose spectral reflectance curves and observed "blue" and red reflectances are shown in Fig. 5. The values of the "blue" reflectances appear to be plotted in an unusual region of the spectrum because of the unconventional effective wave length

[2] No information on the color temperature of the lamp was supplied. Actually, the color temperature is quite variable from one instrument to another, because of differences in lamp voltage. Hence the color temperature of 2400° K., a conservatively high estimate, was assumed for definiteness.

which was found for the blue filter[3]. The large discrepancies between observed reflectances and the corresponding monochromatic reflectances are contributed to by at least two factors in addition to this factor of unfiltered infra-red light. The presence of infra-red fluorescence, as discussed in Part I, Section IV, would tend to raise the measured blue reflectances above their true values. Likewise, the unfortunate geometry of illumination and viewing used in the instrument tends to make all measured reflectances higher than their proper values. This effect of geometry will be discussed in the next section.

SECTION III

Geometrical Features of the Instrument

The geometry of illumination and viewing in the Lange instrument is poorly defined. The position of the lamp is adjustable as regards distance from the sample, but it is difficult to reproduce a given position after changing lamps. The angular spread of the incident beam, which is diverging, is determined by the lamp position. The angular distribution of light in the incident beam is such that the observed reflectances are very sensitive to pressure of the photocell-lamp unit on the sample, as slight bending, or cockling, of the sample changes the distribution of light over the surface of the photocell.

The geometry is such that specularly reflected light contributes heavily to the observed reflectances. A "front-surface" mirror registered an apparent reflectance of 112 per cent. It is difficult to test directly the effect of specularly reflected light by using paper samples of varying gloss, because the samples need to be of nearly identical spectral character and to differ only in gloss in order to present an unambiguous answer. A more striking illustration of the unfortunateness of the choice of geometry is afforded by the following data. A black-felted paper was found to give a reading of 3.5 per cent with no filter, but with the blue filter, the red filter, and a combination of blue and red filters, the observed readings were, respectively, 45.9, 23.8, and 83.0 per cent! Such anomalies can be accounted for only by specular reflection and by fluorescence, primarily the former.

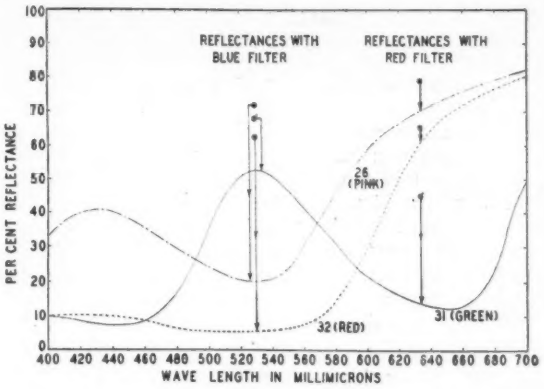


FIG. 5.

Spectrophotometric curves of pink, green and red samples with "blue" and red reflectances obtained on the Lange Photoelectric Reflection Meter. Magnesium carbonate, 100 per cent.

[3] The filter appeared blue to the eye, but, as indicated before, was far from being stenochromatic; the centroid of the *ET²S* curve, which determines the effective wave length, is at approximately 530 millimicrons, even though the peak of the transmittance curve is in the neighborhood of 450 millimicrons. This effective wave length was estimated without regard to the infra-red region.

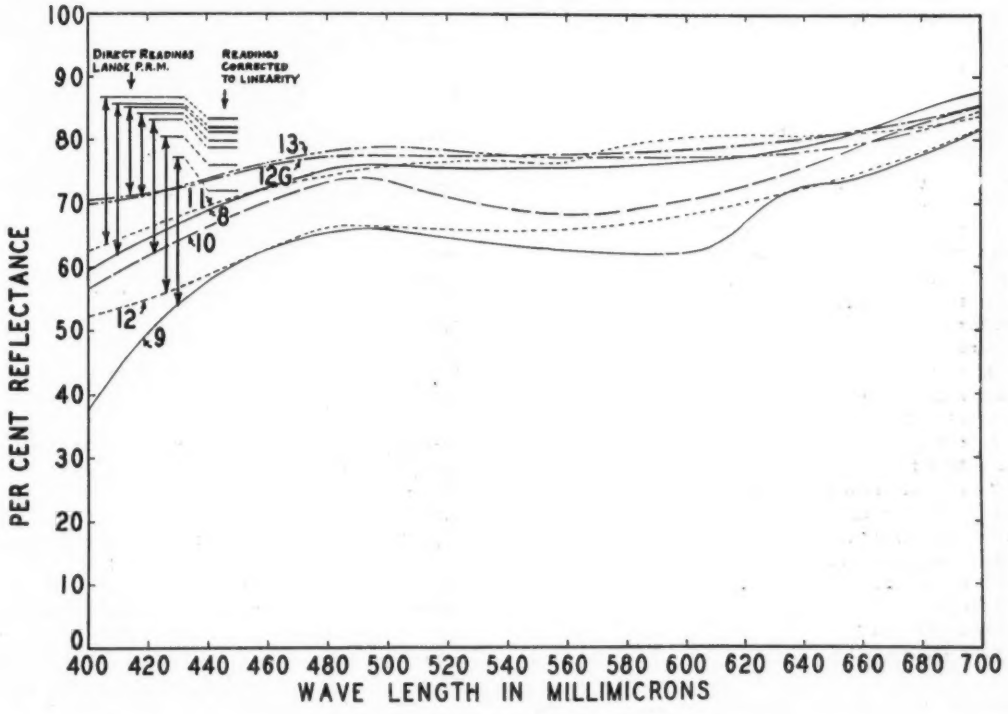


FIG. 4.

Spectrophotometric curves, and direct and corrected data obtained on the Lange Photoelectric Reflection Meter, for "white" paper samples (unfiltered light). Magnesium carbonate, 100 per cent.

SECTION IV

Photometrical Features of the Instrument

The main consideration in photometry by direct measurement of photocurrents is that of linearity, i.e., the meter reading must be directly proportional to the light flux incident on the photocell. The fulfillment of this condition rests entirely with the *particular* photocell and its associated electrical circuit.

The linearity of this particular photocell and meter combination was tested by an application of the inverse square law of light intensity variation. The photocell was mounted so that its surface was horizontal. A shielded, concentrated filament lamp was mounted vertically over the photocell in such a manner that its height above the photocell could be varied. The voltage across the lamp was maintained at a constant value by means of a rheostat in series with the battery supplying current to the lamp. Meter readings were taken as a function of the height of the lamp filament above the photocell surface, which height was measured with a cathetometer. Fig. 6 shows the resulting calibration curve obtained by plotting meter readings as a function of the energy incident on the cell surface. The energy was inversely proportional to the square of the distance between the lamp filament and the photocell surface. It is seen that this particular instrument was not linear. The maximum deviation from linearity was 7.5 scale divisions which occurred at a meter reading of 44, a percentage error of 17 per cent. All data given in this report were corrected for this non-linearity.

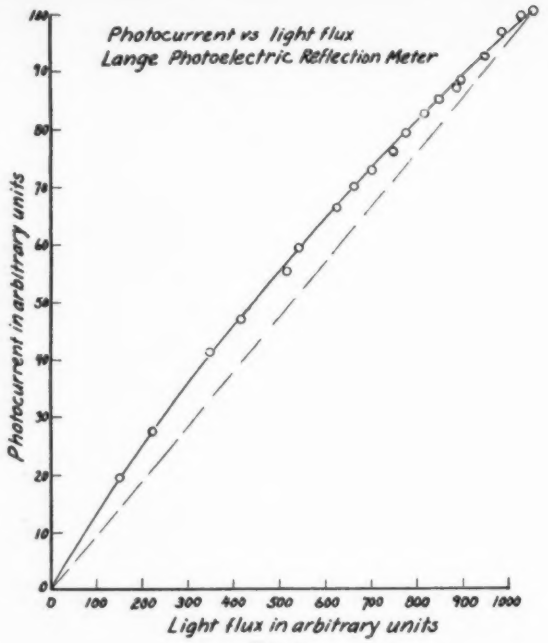


FIG. 6.

Vacuum Washers vs. Diffusers*

By H. A. Morrison[1]

Abstract

Multiple stage vacuum filters, so designed that air is not intimately mixed with black liquor, are established as commercially superior to diffusers for washing Southern kraft pulp. The filter washing system requires careful planning at every point. Such a system excels diffusers in all particulars.

Two types of washing equipment are used in kraft pulp for removal of black liquor. They are continuous vacuum filters arranged for multi-stage washing by countercurrent methods and closed diffusers, usually arranged in series.

Diffusers were universally used until a few years ago. Efforts to adapt vacuum filters to kraft washing, especially upon pulp from the resinous woods of the southern United States, started sixteen years ago, but have only recently become entirely successful. A new type of filter in a fully developed and a complete washing system is now commercially well established.

Before comparing these, each system will be briefly discussed and described.

Vacuum Washers

The vacuum filter functions to form and wash a continuous sheet of the raw or partially refined pulp. Wash liquor and hot wash water are applied to the traveling sheet as it passes over the vacuum drums.

Earlier difficulties and losses due to foaming have been corrected by so designing the filter that the mixing of air with liquor is avoided. Foaming of black liquor is negligible unless considerable volumes of air are intimately mixed therein.

Originally, complete washing was performed on single step units but later experience has shown that multi-stage counter current operation with three units in series provides highest capacity per dollar of cost, the lowest salt cake loss and the strongest black liquor to the evaporators.

On vacuum filters, the sheet of pulp is approximately one half inch thick but the wash liquid is so well distributed that the operation is true displacement with but slight mixing of water or weak wash liquor with the liquor contained in the sheet as formed.

Essential points which require special attention in a filter washing system are: (1) accurate regulation to provide uniform feed consistency; (2) the formation of sheets which are smooth and of uniform thickness and porosity; (3) production should be kept at an even rate; (4) close control of wash water temperature is desirable and (5) throughout the system, violent agitation in open containers, with resulting foaming by air entrainment must be absolutely prevented.

It is easy and inexpensive to closely check and

* Presented at the fall meeting of the Technical Association of the Pulp and Paper Industry, Hotel De Soto, Savannah, Ga., Oct. 18-21, 1937.

[1] Member TAPPI, Engineer, Oliver United Filters, Inc., New York, N. Y.

record every feature of filter performance so that exact cost and loss figures can be kept.

Diffusers

In the diffuser washing system, the digesters are blown into closed tanks, usually arranged in groups of five or six units. Diffusers are commonly built with 5 to 10 per cent greater volumetric capacity than that of the digesters they serve.

Theoretically, diffusers give their best possible result when operated in series according to counter current washing principles. Perhaps, as indicated below, straight water washing by displacement, using water at 185 to 190 deg. F. will give a better average result.

Power and maintenance charges with diffusers are less per ton than for filters. Diffuser performance is extremely difficult to check and it is most unusual for a kraft mill to have accurate cost and loss data on its diffusers.

Mechanical treatment of the raw stock before washing brings about a substantial power economy as compared to using jordans on the washed pulp in a kraft board mill. Refiners fit naturally into the filter system flow sheet and refining promotes better salt cake recovery on filters. The treated pulp is evenly dispersed in black liquor and the fiber bundles are separated so that a better sheet is formed. Such a sheet requires less water for washing.

The application of refiners for mechanical treatment of pulp before washing in diffusers presents some serious difficulties. Regulation of consistency of refiner feed and the handling of the bulky stock in diffusers, after refining, have not yet been solved.

Liquor recovery per digester varies over wide limits, as rates of drainage, percentage of voids, degree of packing—these and other factors introduce variables.

Under ideal conditions, diffusers produce excellent results, but they "work in the dark" and when average performance has been accurately determined, the net result is often disappointing.

Diffuser Performance

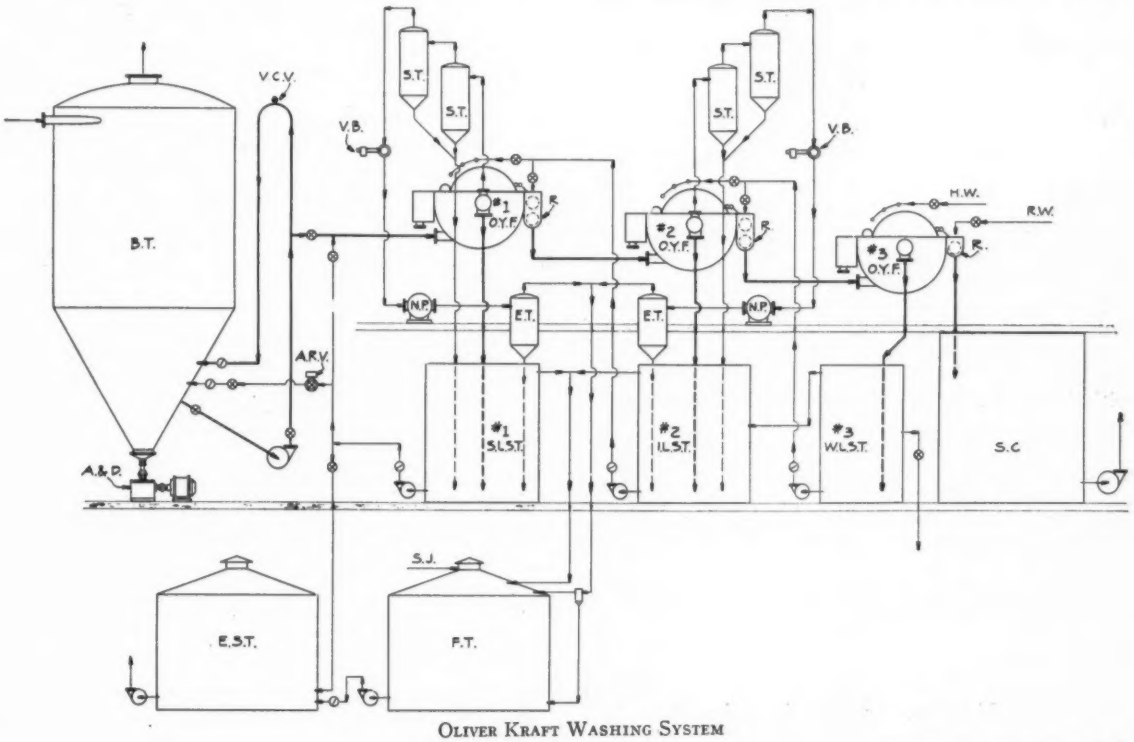
The following notes represent work done by an unbiased investigator who sought to improve digester performance in his own mill:

A diffuser was washed down to 0 deg. Be. at 130 deg. F. in seven hours. During the first three hours it was washed with liquor at 40 deg. Be. at 155 deg. F. (equivalent to 6.6 deg. Be. at 60 deg. F.) and then with hot water. During the first five and three quarter hours the recovered liquor went to strong liquor storage. After this liquor was down to 3 deg. Be. at 155 deg. F. (equivalent to 5.6 deg. Be. at 60 deg. F.), it went to the series line for use as a wash on stronger diffusers. The total elapsed time for washing was nine and three quarter hours. The recovered strong liquor was 7 deg. Be. at 170 deg. F. (10.2 deg. Be. at 60 deg. F.)

A straight water wash gave better results with wash water at 185 to 190 deg. F. Colder wash water is much less effective.

The name "diffuser" is a misnomer, because this type washer does good work only when operated upon the displacement principle. The name diffuser is not applicable since but little soda is contained inside the fibers. Tests have shown less than 1 per cent of the total soda is actually held within the fibers. Repeated tests have proved this point.

The best wash curve is one that breaks sharply, showing that minimum dilution and mixing has occurred. The wash should act the same as a solid piston pushing the column of liquor ahead of it. This plunger effect can be best illustrated by washing a test lot of pulp with oil. This test provides a right



Oliver Kraft Washing System

angle break in the wash curve with little or no mixing, or dilution, having occurred.

A diffuser, not under pressure, contains a large volume of steam. Turning on colder liquids condenses this steam and forms a vacuum by condensation. Thus serious dilution takes place before washing really starts.

By actual test on a diffuser containing 4 tons of pulp as blown, 3800 gallons of water were required to completely fill the diffuser. The voids amounted to about 500 cubic feet, in this case.

A simple calculation based upon the above data shows that 3800 gallons of wash can be added before any liquor flows from the diffuser. If thorough mixing were practiced, the recovered liquor would be reduced about 4 deg. Be. Since there is always some mixing in a diffuser, due to channeling, floating pulp and open spaces, it is best to apply wash liquor and wash water at a moderate rate of flow and to use a distributing baffle where wash enters at the top of the diffuser.

The tendency of fibers to float in a diffuser is due to air bubbles adhering to individual fibers and can be corrected by putting the diffuser under moderate pressure. Pressure reduces the air spaces and causes the fibers to sink.

If pressure exceeds 30 to 40 pounds in the diffuser, the pulp packs to such an extent that the rate of drainage is seriously reduced.

In general, diffuser results are unaffected by stock hardness or original moisture content of the wood.

Wash water or liquor should be very hot, namely around 190 deg. F. when practicable.

The rate or method of blowing the digesters seems not to affect washing in diffusers.

As against the general opinion that series or counter current washing, if carefully handled, will always show best salt cake recovery in liquor of higher concentration, there is much to be said in favor of straight water washing.

A test run on a 4-ton diffuser charge, using water wash only, was completed in 5 hours and 8600 gallons of strong liquor at 15 per cent solids, were recovered.

Vacuum Washer Performance

The general features of a vacuum filter now built especially for kraft pulp washing and the more important features of one washing system are well described in a paper read at the Springfield meeting of the Superintendents' Association June 1937, "Modern Method of Washing Kraft Brown Stock", by C. Fuhrmeister, Jr. (*The Paper Mill,* July 10, 1937.)

Repetition will be avoided by stating merely that the washer described in this article avoids mixing air with the liquor. This eliminates the principal cause of foaming.

The system provides uniform feed control. Repulping of stock between washers is handled in a manner that avoids foaming. Three distinct washing steps are advised on southern kraft, since this insures a better net result than is possible in a single or two stage washing plant.

With the above system, the pulp sheet is normally one half inch thick, leaves each washer at about 12 per cent and travels at the rate of approximately 125 feet per minute.

A single line of three washers in series will handle 300 tons per 24 hours. Various sizes of washers for capacities from 100 to 350 tons per line are available.

With all operations controlled from a central switch board, a single operator can comfortably operate such a system.

All varieties of alkaline pulps are now being washed on vacuum washers for removal and recovery of black liquor. One soda pulp mill uses two stage washing but most of them operate single stage.

Easy bleaching sulphate, kraft for bag and wrapper stock and liner board kraft pulp are all being washed on filters. Vacuum filter wash systems are in daily operation in Canada, the United States and Sweden.

Following are a few typical examples of data on vacuum filter washing of kraft pulp:

TABLE 1

Two Stage	Easy bleaching kraft pulp (permanganate number 75)
Feed	1.2 per cent at 180° F. in liquor at 16° Be. (60° F.)
Speed	120 feet per minute
Vacuum	12 inches
Cake	½ inch thick and well formed, 12 per cent a.d.
Capacity	20 tons per 24 hours per foot of drum face
Salt cake loss (by burning test)	40 pounds per ton of pulp
Liquor to evaporator	11.8 deg. Be (at 60 deg. F.)

TABLE 2

Two Stage	Kraft liner board pulp (permanganate number 110)
Feed	1.0 per cent at 175° F. in liquor at 17° Be. (60° F.)
Speed	133 feet per minute
Vacuum	10 inches
Cake	¼ inch thick and 22 per cent a.d.
Capacity	23 tons per foot of filter face
Salt cake loss	60 pounds per ton of pulp
Liquor to evaporators	12.2 deg. Be. (at 60 deg. F.)

TABLE 3

Two Stage	Standard hard kraft stock for bag and wrapper
Speed	133 feet per minute
Vacuum	10-12 inches
Cake	⅜ inch thick and 20 per cent a.d.
Capacity	23 tons per foot of filter face
Salt cake loss	30 pounds per ton of pulp
Liquor to evaporators	12.8 deg. Be. (60 deg. F.)

TABLE 4

Single stage wash on easy bleaching sulphate pulp.

Salt cake loss	44 pounds per ton a.d. pulp (3 year average)
Liquor to evaporators	11.2 deg. Be. at 60 deg. F. (3 year average)

Two large kraft liner pulp mills, using three stage washing systems, are now being built in the southern United States.

It is entirely safe to predict that these vacuum filter washing systems will send black liquor to the evaporators at above 14 deg. Be. (corrected to 60 deg. F.) and that they will show a total washing loss below sixty pounds of salt cake per air-dry ton of pulp.

COMPARATIVE DATA FOR WASHERS VS. DIFFUSERS

	Washers	Difference	Diffusers
Salt cake loss (pounds)	60	50	110
Liquor to evaporators (deg. Be.)	13–14	1	11–13
Power per ton (h.p.)	1.2	0.7	0.5
Labor cost per ton (cents)	3	7	10
Maintenance per ton (cents)	2	0.5	1.5
Installation cost per ton	$500–$600	...	$625

Australian Dailies Get Newsprint

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., December 18, 1937.—Negotiations for approximately 75 per cent of the total newspaper requirements of Australian daily publishers were completed recently by William Dunstan, general manager of the Melbourne *Herald* and *Weekly Times,* who has returned to Australia via Vancouver.

Prior to sailing, Mr. Dunstan visited the Powell River Company's plant at Powell River, B. C., and the plant of Pacific Mills Limited at Pacific Mills, both these plants being associated with five other Canadian Mills in the fulfilling of the Australian contract. These contracts will take care of more than three-quarters of the newsprint consumed by Australian daily papers for the next seven years.

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports, of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS

WEEK ENDING DECEMBER 25, 1937

SUMMARY

Cigarette Paper .....894 cs.
Wall Paper .....34 rolls, 15 bls., 11 cs.
Wall Board .....43 bxs., 1,360 bdls.
Painted Paper .....10 bls.
Paper Hangings .....12 bls.
Newsprint .....8,421 rolls
Printing Paper .....54 rolls, 102 cs.
Wrapping .....222 rolls, 87 cs.
Filter Paper .....14 bls., 98 cs.
Drawing Paper .....44 cs.
Surface Coated Paper .....69 cs.
Surface Baryta Coated Paper .....73 crates, 1 cs.
Metal Covered Paper .....24 cs.
Photo Paper .....11 cs. (unsensitized)
Tracing Paper .....3 cs.
Decalcomania Paper .....9 cs. (duplex)
Decalcomanias .....17 cs.
Colored Paper .....6 cs.
Tissue Paper .....85 cs.
Transfer Paper .....25 cs.
Transfer Pictures .....4 cs.
Writing Paper .....2 cs.
Paper Bobbins .....166 cs.
Straw Board .....118 rolls
Miscellaneous Paper .....96 cs.

CIGARETTE PAPER

De Mauduit Paper Corp., *Manhattan*, Havre, 175 cs.
De Mauduit Paper Corp., *Champlain*, Havre, 2 cs.
Champagne Paper Corp., *Champlain*, Havre, 572 cs.
Champagne Paper Corp., *Aurania*, Southampton, 114 cs.
Champagne Paper Corp., *Aquitania*, Southampton, 30 cs.
Globe Shipping Co., *Exeter*, Marseilles, 1 cs.

WALL PAPER

F. J. Emmerich, *Pr. Roosevelt*, Havre, 6 cs., 14 bls.
F. J. Emmerich, *Manhattan*, Havre, 5 cs., 1 ble.
Globe Shipping Co., *Deutschland*, Hamburg, 34 rolls.

WALL BOARD

——, *Norefjord*, Horneborg, 43 bxs., 1360 bdls.

PAINTED PAPER

F. J. Emmerich, *Champlain*, Havre, 10 bls.

PAPER HANGINGS

W. H. S. Lloyd & Co., *American Banker*, London, 12 bls.

NEWSPRINT

N. Y. Evening Journal, *Pr. Roosevelt*, Hamburg, 289 rolls.
N. Y. Evening Journal, *Vingaren*, Norrkoping, 1515 rolls.
Gilman Paper Co., *Vingaren*, Hallstavik, 662 rolls.
Brooklyn Daily Eagle, *Vingaren*, Hallstavik, 554 rolls.
Wilkinson Bros., Co. Inc., *Vingaren*, Kotka, 54 rolls.
Jay Madden Corp., *Berlin*, Bremen, 593 rolls.
Jay Madden Corp., *Deutschland*, Hamburg, 736 rolls.
Perkins Goodwin & Co., *Deutschland*, Hamburg, 304 rolls.
International Paper Co., *Rio Verde*, Dalhousie, 3641 rolls.
International Paper Sales Co., *Rio Verde*, Dalhousie, 73 rolls.

PRINTING PAPER

S. Bienfang, *Tiradentes*, Rotterdam, 4 cs.
L. A. Consmiller, Inc., *Bremen*, Bremen, 51 cs.
Dingelstedt & Co., *Berlin*, Bremen, 47 cs. 36 rolls.
Keuffel & Esser Co., *Manhattan*, Hamburg, 18 rolls.

WRAPPING PAPER

M. M. Cohen, *Pr. Roosevelt*, Hamburg, 222 rolls.
Steiner Paper Corp., *Deutschland*, Hamburg, 6 cs.
Titan Shipping Co., *Deutschland*, Hamburg, 1 cs.
Keller Dorian Paper Co., *Exeter*, Marseilles, 80 cs.

FILTER PAPER

E. Fougera & Co., *Aurania*, Southampton, 93 cs.
H. Reeve Angel & Co., Inc., *American Banker*, London, 5 cs.
R. U. Delaphnha & Co., *Exeter*, Marseilles, 14 bls.

DRAWING PAPER

H. Reeve Angel & Co., Inc., *American Banker*, London, 6 cs.
Keuffel & Esser Co., *Manhattan*, Hamburg, 38 cs.

SURFACE COATED PAPER

Gevaert Co. of America, *Black Hawk*, Antwerp, 45 cs.
Gevaert Co. of America, *Pennland*, Antwerp, 24 cs.

SURFACE BARYTA COATED PAPER

Globe Shipping Co., *Berlin*, Bremen, 73 crates, 1 cs.

METAL COVERED PAPER

K. Pauli Co., *Deutschland*, Hamburg, 7 cs.
——, *Bremen*, Bremen, 17 cs.

PHOTO PAPER

Medo Photo-Supply Co., *Georgic*, Liverpool, 3 cs.
J. J. Gavin, Co., *Aquitania*, Southampton, 8 cs. (unsensitized).

TRACING PAPER

Steiner Paper Corp., *Deutschland*, Hamburg, 3 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., *Georgic*, Liverpool, 9 cs. (duplex).

DECALCOMANIAS

Sellers Transportation Co., *Bremen*, Bremen, 2 cs.
Sellers Transportation Co., *Berlin*, Bremen, 15 cs.

COLORED PAPER

C. Asche & Co., *Black Hawk*, Antwerp, 4 cs.
D. C. Andrews & Co., *Bremen*, Bremen, 2 cs.

TISSUE PAPER

——, *Tokai Maru*, Kobe, 85 cs.

TRANSFER PAPER

D. C. Andrews & Co., *Deutschland*, Hamburg, 25 cs.

TRANSFER PICTURES

Rohner Gehrig & Co., *Bremen*, Bremen, 4 cs.

WRITING PAPER

Globe Shipping Co., *Manhattan*, Havre, 2 cs.

PAPER BOBBINS

——, *Deutschland*, Hamburg, 166 cs.

STRAW BOARD

——, *Tiradentes*, Rotterdam, 62 rolls.
——, Rotterdam, *Rotterdam*, 56 rolls.

MISCELLANEOUS PAPER

Coty Processing Co., *Champlain*, Havre, 1 cs.
Keuffel & Esser Co., *Pr. Roosevelt*, Hamburg, 40 cs.
T. N. Fairbanks, Co., Inc., *Tokai Maru*, Yokohama, 55 cs.

RAGS, BAGGINGS, ETC.

American Express Co., *Black Hawk*, Antwerp, 128 bls. rags.
Hughes Fawcett, Inc., *Komaki Maru*, Kobe, 24 bls. flax waste.
Castle & Overton, Inc., *Tiradentes*, Rotterdam, 45 bls. bagging.
Manufacturers Trust Co., *Georgic*, Liverpool, 10 bls. rags.
E. J. Keller Co., Inc., *Rotterdam*, ——, 65 bls. bagging.
Hicks Costarino & Co., *Rotterdam*, Rotterdam, 191 bls. bagging.
Loumar Textile By Products, *Rotterdam*, Rotterdam, 73 bls. bagging.
E. Mayer, *Exeter*, Alexandria, 18 bls. rags.
W. Steck & Co., *Exeter*, Alexander, 319 bls. bagging.
——, *Exeter*, Alexandria, 319 bls. bagging.

BONE GLUE

——, *Saturnia*, Trieste, 400 bags.

WOOD PULP BOARDS

Jay Madden Corp., *Vingaren*, Kotka, 5? rolls.

——, *Vingaren,* Viipuri, 220 rolls.

WOOD PULP SHEETS

C. Bishop Co., *Manhattan,* Hamburg, 25 bls.
C. Bishop Co., *Deutschland,* Hamburg, 50 bls.

WOOD PULP

Castle & Overton, Inc., *Deutschland,* Hamburg, 325 bls., wood pulp, 65 tons.
Bankers Trust Co., *Deutschland,* Hamburg, 252 bls. sulphite, 50 tons.
Bulkley Dunton Pulp Co. Inc., *Kolsnaren,* ——, 4900 bls. wood pulp, 1008 tons.
Gottesman & Co. Inc., *Kolsnaren,* Halmstad, 500 bls. sulphite.
——, *Hein Hoyer,* Stugsund, 2750 bls. sulphite, 550 tons.
Johaneson Wales & Sparre, Inc., *Hein Hoyer,* Stugsund, 350 bls. sulphate, 50 tons.
Johaneson Wales & Sparre, Inc., *Hein Hoyer,* Sundsvall, 1500 bls. sulphite, 300 tons.
Johaneson Wales & Sparre, Inc., *Hein Hoyer,* Sundsvall, 600 bls. sulphate, 100 tons.
Mead Sales Co. Inc., *Hein Hoyer,* Sundsvall, 310 bls. sulphite, 62 tons.
——, *Hein Hoyer,* Hernosand, 1053 bls. sulphate, 175 tons.
——, *Hein Hoyer,* Hernosand, 4650 bls. sulphite, 738 tons.
Tradesmans Nat'l. Bank Trust Co., *Norefjord,* Norrsundet, 1000 bls., sulphate, 222 tons.
Stora Kopparberg Corp., *Norefjord,* Skutskar, 1385 bls., dry pulp, 281 tons.
Castle & Overton, Inc., *Vingaren,* Viipuri, 2677 bls. wood pulp.
Lagerloef Trading Co., *Vingaren,* 2100 bls. sulphite, 2113 bls. sulphate.
Lagerloef Trading Co., *Vingaren,* 2374 bls. sulphite, 150 bls. kraft pulp, 125 bls. sulphate.
Johaneson Wales & Sparre, Inc., *Berlin,* Bremen, 508 bls. chemical pulp.
Gottesman & Co. Inc., *Lagaholm,* Halmstad, 2800 bls. sulphite.
Gottesman & Co. Inc., *Consul Olsson,* Sundsvall, 3300 bls. sulphite, 2250 bls. sulphate.
Price & Pierce, Ltd., *Consul Olsson,* Wallvik, 1302 bls. sulphate.
Guaranty Trust Co., *Consul Olsson,* Sundsvall, 150 bls. sulphite, 300 bls. sulphate.

NEWARK IMPORTS

WEEK ENDING DECEMBER 25, 1937

Pagel Horton & Co. Inc., *Consul Olsson,* Gefle, 5540 bls. sulphate.

ALBANY IMPORTS

WEEK ENDING DECEMBER 25, 1937

——, *Hein Hoyer,* Stugsund, 1000 bls. sulphite, 200 tons.
Brown Bros. Harriman & Co., *Hein Hoyer,* Stugsund, 675 bls. sulphite, 135 tons.
Brown Bros. Harriman & Co., *Hein Hoyer,* Hernosand, 6000 bls. sulphate, 1000 tons.
Brown Bros. Harriman & Co., *Hein Hoyer,* Sundsvall, 2000 bls. sulphite, 400 tons.
Johaneson Wales & Sparre, Inc., *Hein Hoyer,* Sundsvall, 10175 bls. sulphite, 900 tons.
Johaneson Wales & Sparre, Inc., *Hein Hoyer,* 2550 bls. sulphate, 425 tons.
Johaneson Wales & Sparre, Inc., *Hein Hoyer,* 2375 bls. chemical pulp, 475 tons.
Price & Pierce, Ltd., *Idefjord,* ——, 900 bls. unbleached sulphite.
Price & Pierce, Ltd., *Idefjord,* ——, 6825 bls. bleached sulphite.

PORTLAND IMPORTS

WEEK ENDING DECEMBER 25, 1937

Price & Pierce, Ltd., *Consul Olsson,* Sweden, 2064 bls. sulphite.
Pagel Horton & Co. Inc., *Consul Olsson,* Sweden, 2500 bls. sulphite.
Stora Kopparberg Corp., *Consul Olsson,* Sweden, 900 bls. wood pulp.
Gottesman & Co., Inc., *Consul Olsson,* Sweden, 3240 bls. sulphite.
Bulkley Dunton Pulp Co. Inc., *Consul Olsson,* ——, 1250 bls. sulphite.
Gottesman & Co. Inc., *Lagaholm,* Sweden, 3210 bls. sulphate.

NEW LONDON IMPORTS

WEEK ENDING DECEMBER 25, 1937

Price & Pierce, Ltd., *Sagoporack,* ——, 150 bls. unbleached sulphate.
Price & Pierce, Ltd., *Sagoporack,* ——, 2850 bls. unbleached sulphite.

BOSTON IMPORTS

WEEK ENDING DECEMBER 25, 1937

——, *Norefjord,* Hernosand, 150 bls. kraft pulp, 25 tons.
Central Hanover Bank Trust Co., *Norefjord,* Hernosand, 1050 bls. sulphite, 175 tons.
Bank of N. Y. Trust Co., *Norefjord,* Hernosand, 450 bls., sulphite, 75 tons.
Bank of N. Y. Trust Co., *Norefjord,* Hernosand, 450 bls. sulphate, 75 tons.
Price & Pierce, Ltd., *Norefjord,* Hernosand, 1650 bls. unbleached sulphite, 275 tons.
Price & Pierce, Ltd., *Norefjord,* Wallvik, 3612 bls. unbleached sulphite, 610 tons.
Price & Pierce, Ltd., *Norefjord,* Wallvik, 3000 bls., unbleached sulphate, 506 tons.
Price & Pierce, Ltd., *Norefjord,* Wallvik, 250 bls. unbleached mechanical pulp, 50 tons.
Tradesmans Nat'l. Bank Trust Co., *Norefjord,* Norrsundet, 2050 bls. sulphate, 470 tons.
——, *Norefjord,* Horneborg, 2380 bdls. wall board.
Bulkley Dunton Pulp Co. Inc., *Norefjord,* ——, 1050 bls., sulphite, 200 tons.
Parsons & Whittemore, Inc., *Bochum,* ——, 1498 bls. wood pulp.
Price & Pierce, Ltd., *Tortugas,* ——, 300 bls. unbleached sulphite.
Gottesman & Co. Inc., *Lagaholm,* Sweden, 7550 bls. sulphite.

PHILADELPHIA IMPORTS

WEEK ENDING DECEMBER 25, 1937

Philadelphia Inquirer, *Vingaren,* Hallstavik, 497 rolls newsprint.
Wilkinson Bros., Co. Inc., *Vingaren,* Kotka, 66 rolls newsprint.
J. W. Hampton Jr. Co., *Vingaren,* Kotka, 633 rolls newsprint.
Castle & Overton, Inc., *Vingaren,* Viipuri, 1518 bls. wood pulp.
Price & Pierce, Ltd., *Gonzenheim,* ——, 1500 bls. unbleached sulphate.
Price & Pierce, Ltd., *Gonzenheim,* —— 726 bls. unbleached sulphite.
Price & Pierce, Ltd., *Gonzenheim,* ——, 2100 bls. unbleached mechanical pulp.
Price & Pierce, Ltd., *Scanyork,* ——, 240 bls. bleached sulphite.

WILMINGTON IMPORTS

WEEK ENDING DECEMBER 25, 1937

Price & Pierce, Ltd., *Gonzenheim,* ——, 6600 bls., unbleached sulphite.

BALTIMORE IMPORTS

WEEK ENDING DECEMBER 25, 1937

Congoleum Nairn Co., *Black Hawk,* Rotterdam, 153 bls. rags.
Congoleum Nairn Co., *Black Hawk,* Antwerp, 123 bls., rags.
Pagel Horton & Co. Inc., *Argosy,* Sweden, 1500 bls., wood pulp.
Gottesman & Co. Inc., *Tortugas,* Norway, 1250 bls., sulphite.
Gottesman & Co. Inc., *Gonzenheim,* Sweden, 3400 bls. sulphite, 4585 bls. sulphate.
Gottesman & Co. Inc., *Delhi,* Sweden, 1315 bls., sulphite.
Gottesman & Co. Inc., *Argosy,* Sweden, 1575 bls., sulphite. 2400 bls., sulphate.

NORFOLK IMPORTS

WEEK ENDING DECEMBER 25, 1937

S. Stern, *Black Hawk,* Rotterdam, 45 coils old rope.
Irving Trust Co., *Black Hawk,* Antwerp, 80 bls., bagging.

New York Market Review

OFFICE OF THE PAPER TRADE JOURNAL
Wednesday, December 29, 1937.

The wholesale paper market as a whole is reported as quiet for the current week. Trading in nearly all grades of paper continues very light, which is seasonal during December, particularly during the holidays. In general, prices remain firm, with fewer complaints reported this week of reductions from the prevailing market prices.

The recession has been attributed in a large measure to the fact that the dealers had so much stock on hand, that buying had to be curtailed until this stock was turned over. On the whole, the expectation in the trade is that inventories have now reached such a low point that a "natural increase" in business activity will take place next month. Thus, in so-called book papers, one large mill reports that merchants are already placing their orders for January delivery, which may be an indication that inventories are so depleted that advance orders are being placed now to make sure that adequate stocks will be on hand at the commencement of the new year.

The newsprint market is normally active, with contract shipments moving in usual volume.

The demand for writing paper is reported as quiet, with prices firm. The tissue market is reported as improved, with prices holding up firmer than for some time past.

The book paper market reports an increase in activity, due to orders being placed for future delivery. Prices are steady.

The demand for kraft paper is reported as light, with prices continuing unchanged.

The box board market is reported as quiet. No changes in prices are reported for the week.

Chemical Pulp

As a result of the continuing downward trend in demand for chemical pulp, the price of mostly every grade is considerably lower this week. Quotations for sulphite pulp for the first quarter of next year, as compared with the last quarter of 1937, have been reduced between ten and fifteen per cent.

Mechanical Pulp

The mechanical pulp market continues to recede. Prices are lower this week.

Old Rope and Bagging

The demand for old rope is sluggish. Prices are lower than the level of the preceding week. The bagging market is reported as quiet, with no price changes noted.

Rags

Trading in the domestic rag market is reported as stagnant. Prices are lower than previous quotations. The foreign rag market reports prices as holding up better because of improved home demand. Nominal prices prevail.

Waste Paper

The waste paper market is reported as quiet. The demand for the foreign grades continues to be more active than the waste paper demand as a whole. Prices are less than last week's listings.

Twine

The demand for twine remains light. Prices show no alteration from the level of last week.

Eastern Mfg. Co. to Reorganize

The Eastern Manufacturing Company on December 28 filed a petition in Federal Court for the northern division of Maine, for reorganization under Section 77-b of the national bankruptcy act. Judge John A. Peters approved the petition and continued the company in temporary possession of the property, directing that all claims and interests of creditors and stockholders be filed on or before March 1, 1938.

The company announced through Edward M. Graham, president, that it had discussed plans of reorganization with its bank creditors and important holders of its bonds, preferred stock and common stock, and that it expected to file with the court a complete reorganization plan within thirty days. Meanwhile, operations will be continued under supervision of the court.

According to the petition, the company's property and assets comprising paper and pulp mills, timberlands, etc., have an aggregate value more than sufficient to pay its obligations, and its operations for the twelve months' period ended November 30, have resulted in a substantial profit.

Acquires Ohio Boxboard Co.

The Great Lakes Box Company, manufacturer of set-up and folding paper boxes, announces the acquisition of the Ohio Boxboard Company, manufacturers of paper box boards, folding cartons, corrugated and fiber shipping containers, etc. In announcing the acquisition of this property, the Great Lakes Paper Box Company states that the increased volume in its business can be very easily handled on its new modern equipment, and that it will not be necessary to add more equipment to its plant but that its program of modernization will be carried forward until all obsolete equipment is replaced by new modern equipment.

Appointed Brown Paper Agent

The Alco Paper Company, Inc., of New Orleans, La., has been appointed distributor in that city and vicinity for Greylock Linen Ledger. This paper is one of the 85 per cent new, white rag ledgers made by the L. L. Brown Paper Company, Adams, Mass.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, December 29, 1937.

BLANC FIXE—The blanc fixe market is reported as steady. Prices are firm and conform with the quotations of the preceding week. The pulp is quoted at from $42.50 to $45 per ton, in bulk; the powder at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—The demand for bleaching powder is unchanged for the current week. Prices are firm and continue at previously quoted levels.: Bleaching powder is offered at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The casein market reports demand as fair. Domestic standard ground casein is quoted at 12 cents per pound; domestic finely ground casein at 12½ cents per pound; all in bags, car lot quantities.

CAUSTIC SODA—The demand for caustic soda is reported as steady. Prices are firm. Solid caustic soda is quoted at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—The china clay market continues at about the level of last week. Prices are firm. Imported clay is quoted at from $14.50 to $25 per ton, ship side. Domestic filler clay is offered at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, at mines.

CHLORINE—The demand for chlorine is reported as steady. Prices continue unchanged from the quotations of the previous week. Chlorine is quoted at $2.15 per 100 pounds, in single-unit tank cars, f.o.b. works.

ROSIN—The rosin market reports demand as improved. Prices are rising steadily. Paper making rosin is now quoted at $5.55, wood rosin at $5.45 per 280 pounds, gross weight, in barrels at Savannah. Seventy per cent rosin size is quoted at $2.92 per 100 pounds, in tank cars, f.o.b. shipping point.

SALT CAKE—The demand for salt cake is reported as steady. Little, if any, domestic salt cake is reported available. Quotations range from $12 to $13.50 per ton; chrome salt cake from $11 to $12, f.o.b. shipping point. Imported salt cake is offered at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—The soda ash market continues steady. Prices remain firm. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—The demand for starch is reported as moderate. Prices are unchanged for the current week. Globe pearl is offered at $2.60 per 100 pounds, in bags, and at $2.85 in barrels. Special paper starch is quoted at $2.70 per 100 pounds, in bags, and at $2.95 in barrels; all prices in car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—The sulphate of alumina market continues on about the level of the preceding week. Prices are firm. The commercial grades are quoted at from $1.25 to $1.60; iron free at from $2 to $2.25 per 100 pounds, in barrels, at works.

SULPHUR—The demand for sulphur is steady, with prices unchanged from the quotations of the previous week. Annual contracts are quoted at $18 per long ton, f.o.b., cars at mines. Spot and nearby car lots are offered at $21 per ton.

TALC—The talc market reports demand as moderate. Prices are unchanged for the current week. Domestic talc is quoted at from $15 to $18 per ton, Eastern mines. Imported talc is offered at from $25 to $40 per ton, on dock.

Market Quotations

Paper

(Delivered New York)

News, per ton—			
Roll, contract	42.50	@	—
Sheets	47.50	@	—
Kraft—per cwt.—Delivered Zone A			
No. 1 Northern	$5.50	@	—
Superstandard	5.00	@	—
Northern Standard Wrapping	4.75	@	—
Standard Wrapping	4.50	@	—
Tissues—Per Ream—Carlots			
White No. 1	1.02½	@	—
White No. 1 M. G.	.97½	@	—
White No. 1½	.67½	@	—
White No. 2	.60	@	—
Anti-Tarnish M. G.	.75	@	—
Colored	.87½	@	—
Kraft	.75	@	—
Manila	.60	@	—
Unbl. Toilet, 1 M.	3.40	@	—
Bleached Toilet	5.26	@	—
Paper Towels—			
Unbleached	1.95	@	—
Bleached	3.15	@	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	$8.25	@	$10.25
No. 2 Jute	7.50	@	9.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Boards, per ton—			
News	35.00	@	37.50
Chip	35.00	@	37.50
Sgl. Mla. Ll. Chip	52.50	@	—
Jute Lined Chip	52.50	@	—
White Pat. Coated	65.00	@	—
Kraft Liners	55.00	@	—
Binders Boards	75.00	@	80.00

The following are representative of distributors' resale prices:—

Rag Content Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1.	$41.40@$48.50	$42.55@$50.00
100% Rag	32.80@ 38.50	33.95@ 39.75
85% Rag	.....	32.20@ 37.75
75% Rag	24.75@ 29.00	25.90@ 30.50
65% Rag	21.65@ 26.25	22.80@ 27.75
50% Rag	18.70@ 22.75	19.90@ 24.25
25% Rag	15.80@ 19.25	16.95@ 20.75

Regular Colors @ $1.50 cwt. extra.
Heavy Colors @ $3.00 cwt. extra

Sulphite Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$9.35@$11.50	$10.55@$12.75
No. 2	8.50@ 10.25	9.65@ 11.75
No. 4	7.60@ 9.25	8.80@ 10.75

Regular Colors @ $1.50 cwt. extra.
Heavy Colors @ $3.00 cwt. extra.

Free Sheet Book Papers—
White, Cased Paper,
Delivered in Zone 1:

No. 1 Glossy Coated	$12.15@$14.25
No. 2 Glossy Coated	10.55@ 12.25
No. 3 Glossy Coated	9.35@ 11.00
No. 4 Glossy Coated	8.80@ 10.50
No. 1 Antique (watermarked)	8.80@ 10.50
No. 2 Offset	8.05@ 9.50
A Grade E. F.	7.90@ 9.50
A Grade S. & S. C.	8.15@ 9.75
B Grade E. F.	7.30@ 8.75
B Grade S. & S. C.	7.55@ 9.00
C Grade E. F.	7.00@ 8.50
C Grade S. & S. C.	7.25@ 8.75
D Grade E. F.	6.75@ 8.25
D Grade S. & S. C.	7.00@ 8.50

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	35.00	@	36.00
Dry	40.00	@	42.00
(Delivered)			
No. 1 Domestic and Canadian	34.00	@	35.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	3.00	@	4.65
Prime Qualities—			
Easy-Bleaching Sulphite	2.75	@	3.50
Strong Unbleached			
Sulphite	2.25	@	3.25
(On Dock, Atlantic Ports)			
Kraft Bleached	3.00	@	4.00
Kraft Light & Strong	2.75	@	3.00
Kraft No. 1	2.50	@	3.25
Kraft No. 2	2.00	@	2.25
(F.o.b. Pulp Mill)			
Kraft Domestic	2.00	@	2.50
(Delivered)			
Soda Bleached	2.90	@	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	7.00	@	7.25
Silesias, No. 1	5.00	@	5.25
New Unbleached	7.50	@	8.00
Blue Overall	6.00	@	6.25
Fancy	2.60	@	2.65
Washables	2.10	@	2.25
Mixed Khaki Cuttings	3.60	@	3.75
O. D. Khaki Cuttings	4.35	@	4.50

Old Rags

White, No. 1—			
Repacked	3.40	@	3.60
Miscellaneous	2.75	@	3.00
White, No. 2—			
Repacked	2.10	@	2.25
Miscellaneous	1.70	@	1.80
Thirds and Blues—			
Repacked	1.40	@	1.50
Miscellaneous	1.25	@	1.30
Roofing Rags—			
No. 1	1.15	@	1.25
No. 2	.75	@	.80
No. 3 (bagging)	.65	@	.70
No. 4	.65	@	.70
No. 5A	.65	@	.70

Foreign Rags

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	@	2.20
New Light Silesias	5.50	@	5.75
Light Flannelettes	5.50	@	5.75
New White Cuttings	7.00	@	7.50
New Light Oxford	4.00	@	4.50
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	7.50	@	8.50
No. 2 White Linens	6.50	@	7.50
No. 3 White Linens	4.50	@	5.50

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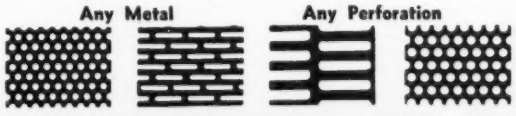

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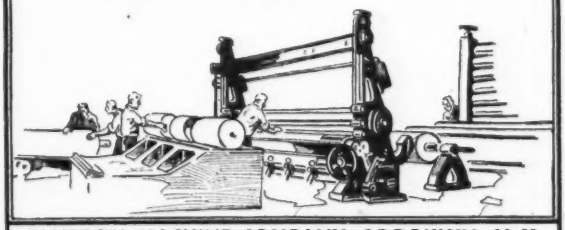
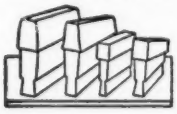


CAMERON MACHINE COMPANY BROOKLYN, N. Y.

"Buffalo" PAPER STOCK PUMPS
are Accurately Rated to give
GUARANTEED PERFORMANCE
BUFFALO PUMPS, INC.
443 BROADWAY — BUFFALO, N. Y.
Branch Engineering Offices in Principal Cities In Canada: Canada Pumps Ltd., Kitchener, Ont.

WOOD COGS

OF ALL DESCRIPTIONS, BLANK OR FINISHED
From Thoroughly Seasoned New Hampshire Rock Maple



The Best Cog Stock in the World

THOMPSON MANUFACTURING CO.
Lancaster, - New Hampshire

CLINTON STARCHES

Special Grades for Beater and Top Sizing

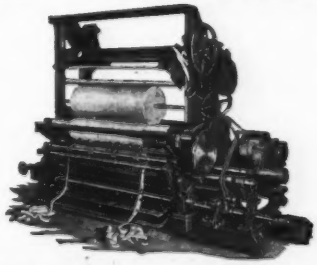
Manufactured by
CLINTON COMPANY
CLINTON, IOWA

QUALITY **SERVICE**

LANGSTON SLITTERS AND ROLL WINDERS

help reduce upkeep and labor costs in mill, finishing room or paper converting plant. Samuel M. Langston Company, Camden, N. J.

SHEAR CUT
CLEAN CUT



No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	@	4.75
No. 2 White Cotton.	3.25	@	3.75
No. 3 White Cotton.	2.50	@	3.00
No. 4 White Cotton.	1.90	@	2.20
Extra Light Prints..	2.00	@	2.40
Ord. Light Prints...	1.75	@	2.15
Med. Light Prints...	1.55	@	1.95
Dutch Blue Cottons..	2.25	@	2.50
French Blue Linens..	3.00	@	—
Checks and Blues...	2.00	@	—
Linsey Garments....	1.90	@	2.00
Dark Cottons.....	1.50	@	1.60
Old Shopperies.....	1.30	@	1.45
New Shopperies.....	1.45	@	1.50
French Blues.....	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.20	@	2.25
Domestic	2.00	@	2.15
Wool Tares, light....	1.50	@	1.75
Wool Tares, heavy..	2.00	@	2.10
Bright Bagging.....	1.60	@	1.70
Manila Rope—			
Foreign	2.75	@	3.00
Domestic	2.75	@	3.00
Jute Threads.....	2.75	@	3.00
Sisal Strings.....	1.75	@	2.00
Mixed Strings.....	.60	@	.70

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.50	@	2.60
Ordinary Hard White No. 1....	1.90	@	2.00
Soft White No. 1..	1.80	@	2.20
Flat Stock—			
Stitchless	.70	@	.80
Overissue Mag.....	.60	@	.70
Solid Flat Book...	.50	@	.55
Crumbled No. 1...	.40	@	.45
Ledger Stock.....	.75	@	.80
New B. B. Chips....	.15	@	.20
Manila—			
New Env. Cut....	1.85	@	2.00
New Cuttings.....	1.50	@	1.60
Old Kraft Machine—			
Compressed bales..	.70	@	.80
News—			
No. 1 White News	1.10	@	1.20
Strictly Overissue.	.45	@	.50
Strictly Folded....	.30	@	.35
No. 1 Mixed Paper..	.15	@	.20

Twines

(F. o. b. Mill)

(Soft Fiber)			
Coarse Polished—			
India	.15	@	.16½
White Hemp.....	.16	@	.17½
Fine Polished—			
Fine India.....	.20	@	.22
Unpolished—			
Box	.11	@	.11½
Paper Makers.....	.11	@	.12¼
Tube Rope	.11½	@	.14¼
Wall Paper	.12½	@	.13¼
Wrapping	.14	@	.14½
Soft Fiber Rope...	.13¼	@	.14¼
Cotton	.17	@	.21
(Hard Fiber)			
Medium Java.....	.12	@	.12½
Mex. Sisal.....	.11	@	.11½
Manila	.21	@	.28
Domestic	3.00	@	3.25
Transmission Rope...	1.75	@	1.90
Soft Jute Ropes.....	1.90	@	2.00
Jute Carpet Threads.	1.40	@	1.60
Gunny Bagging—			
Foreign	2.15	@	2.25
Domestic	1.80	@	1.90
Bleachery Burlap....	3.50	@	4.00
Scrap Burlap			
Foreign	1.80	@	1.90
Domestic	1.80	@	1.90
Scrap Sisal.....	1.75	@	1.80
Scrap Sisal for Shredding	2.00	@	2.25
Wool Tares, Heavy..	2.00	@	2.05
New Burlap Cuttings	2.00	@	2.25
Aust. wool pouches..	3.00	@	3.25
Heavy Baling bagging	1.90	@	2.00
Paper Mill Bagging.	1.50	@	1.60
Bagging No. 2.....	.85	@	1.00

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	.03	@	.03¼
New White No. 1.	.07½	@	.07¾
New White No. 2.	.05½	@	.05¾
New Light Flannelettes	—	@	.06
Silesias No. 1.....	.05½	@	.06
New Black Silesias..	.03¾	@	.04
Silesias No. 1			
Soft Unbleached.....	.07	@	.07½
Blue Cheviot	.06½	@	.06¾
Fancy	.03	@	.03¼
Washable	.02¾	@	.03
Cottons—According to grades—			
Blue Overalls.....	.06½	@	.06¾
New Black, soft...	.03¾	@	.04
Khaki Cuttings.....	.03½	@	.04
O. D. Khaki.....	.04	@	.04½
Corduroy	.02¾	@	.03
New Canvas.....	.07½	@	.07¾
B. V. D. Cuttings.	.08¼	@	.08½

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues.....	1.75	@	2.00
Third and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings.....	3.90	@	4.00
Roofing Stock—			
No. 1.....	1.00	@	1.10
No. 2.....	.75	@	.85
No. 3.....	.65	@	.70

Foreign Rags

(F. o. b. Boston)

Dark Cottons.....	1.30	@	1.40
Dutch Blues.....	2.85	@	3.00
New Checks and Blues	2.85	@	3.00
Old Fustians.....	2.50	@	2.60
Old Linsey Garments	1.90	@	2.00
New Silesias.....	6.00	@	6.50

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.07	@	.07½
New White, No. 2.	.04½	@	.05
Light Silesias.....	.05½	@	—
Silesias, No. 1....	—	@	.05½
Black Silesias, soft.	.03	@	.03½
New Unbleached..	.07	@	.07½
Washable, No. 1..	.02	@	.02¼
Blue Overall.....	.04	@	.04½
Cottons—According to grades—			
Washable, No. 2..	.01½	@	.01¾
New Blue.....	.01¼	@	.01½
Fancy Percales....	—	@	.03½
New Black Soft...	.03	@	.03½
New Light Seconds	—	@	.05½
New Dark Seconds	1.00	@	1.25
Khaki Cuttings—			
No. 1 O. D.....	.03½	@	.04
No. 2 Mixed.....	—	@	.02¾
Corduroy	.02½	@	.02¾
New Canvas.....	.06	@	.06½
New Black Mixed.	.02	@	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.25
Miscellaneous	2.75	@	3.00
Thirds and Blues—			
Miscellaneous	1.25	@	1.50
Repacked	1.50	@	1.75
Black Stockings (Export)	3.00	@	3.50
Roofing Stock—			
Foreign No. 1....	—	@	1.25
Domestic No. 1...	—	@	1.25
Domestic No. 2...	1.00	@	1.10
Roofing Bagging..	.80	@	.90

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.75	@	—
Domestic	1.70	@	1.75
Manila Rope.....	3.00	@	3.25
Sisal Rope.....	2.00	@	2.25
Mixed Rope	1.00	@	1.10
Scrap—			
No. 1.....	1.50	@	—
No. 2.....	1.00	@	1.25
Wool Tares, heavy..	3.25	@	3.50
Mixed Strings.....	1.00	@	1.10
No. 1 New Light Burlap	3.00	@	3.50
New Burlap Cuttings	2.00	@	2.25

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White.	2.35	@	2.40
No. 2 Hard White.	2.00	@	2.10
No. 1 Soft White..	2.00	@	2.10
No. 2 Soft White..	1.40	@	1.50
No. 1 Mixed.....	.70	@	.75
Solid Ledger Stock..	1.50	@	1.60
Ledger Stock, white.	1.25	@	1.30
Ledger Stock, colored	.85	@	.90
No. 1 Books, heavy..	.85	@	.90
Manila Cuttings.....	1.50	@	1.75
Print Manila.....	.45	@	.50
Container Manila....	—	@	.40
Kraft Paper.....	.90	@	.95
No. 1 Mixed Paper..	.25	@	.30
Straw Board Chip...	.25	@	.30
Binders Board Chip.	.25	@	.30
Corrugated Board...	.50	@	.55
Overissue News.....	.55	@	.60
Old Newspapers	.30	@	.35

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White.	2.25	@	2.40
No. 1 Soft White..	1.85	@	2.15
No. 2 Mixed.....	.75	@	.80
Solid Ledger Books..	1.50	@	1.75
Overissue Ledger Stock	1.30	@	1.50
Mixed Ledgers.....	.85	@	.90
No. 1 Books, heavy..	.65	@	.75
No. 1 Books, light...	.65	@	.75
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.60	@	1.70
Manila Envelope Cuttings, extra quality	2.00	@	2.10
No. 1 Old Manila....	.85	@	.95
White Blank News..	1.30	@	1.40
No. 1 Kraft.....	.90	@	1.00
Mixed Papers	.10	@	.15
Print Manila.....	.45	@	.50
Container Manilas...	.27½	@	—
Old Newspapers.....	.20	@	.25
Paper Wool Strings.	—	@	.60
Overissue News.....	.45	@	.50
Box Board Chips....	.35	@	.40
Corrugated Boxes...	.25	@	.27½
Kraft corrugated boxes	.60	@	.70
Screenings wrappers.	.45	@	.50

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	2.50	@	3.00

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings....	3.15	@	3.25
No. 1 Hard White.	2.50	@	2.60
No. 1 Soft White..	2.05	@	2.10
Ledger & Writings..	1.30	@	1.40
Solid Books.....	1.20	@	1.25
Blanks	1.40	@	1.50
Krafts	.90	@	1.00
New Kraft Cuts.....	1.70	@	1.80
Manila Env. Cuts...	2.15	@	2.25
Ex. No. 1 Manila...	2.15	@	2.25
Print Manila.....	1.70	@	1.80
Overissue News.....	.60	@	.70
Old Newspapers—			
No. 1 Folded News	.45	@	.50
No. 1 Mixed Paper	.35	@	.40
Roofing Stocks—			
No. 1.....	2.00	@	2.31
No. 2.....	1.85	@	2.00

TORONTO

Paper

Bonds and Ledgers

Delivered

No. 1 White	.35½	@	.36½
No. 1 Tints	.36½	@	.37½
No. 2 White	.26½	@	—
No. 2 Tints	.27½	@	—
No. 4 White	—	@	.1550
No. 4 Tints	.16	@	.1650
No. 5 Bond—White	.11.35	@	—
No. 5 Bond—Tints	.12.35	@	—
No. 5 Bond—Golden Rod	13.35	@	—
No. 5 Ledger—White	.1185	@	—
No. 5 Ledger—Tints.	.1285	@	—
No. 6 Bond—White	.10.75	@	—
No. 6 Bond—Tints	.11.25	@	—
No. 6 Bond—Golden Rod	12.75	@	—
No. 7 Bond—White .	9.10	@	—
No. 7 Bond—Tints .	9.60	@	—
No. 7 Bond—Golden Rod	11.10	@	—
Book—			
No. 1 M. F.	7.10	@	7.35
No. 2 M. F.	6.85	@	7.20
No. 3 M. F.	5.60	@	6.20
No. 1 S. C.	7.60	@	7.85
No. 2 S. C.	7.10	@	7.35
No. 3 S. C.	6.10	@	6.35
No. 1 Coated and Litho	12.50	@	—
No. 2 Coated and Litho	11.00	@	—
No. 3 Coated and Litho	9.50	@	10.00
Coated tinted.....	13.00	@	13.50
Wrapping—delivered—			
Rag Brown.....	4.85	@	5.55
White Wrap.....	4.00	@	—
"B" Manila.....	4.90	@	6.25
No. 1 Manila.....	5.50	@	7.00
Fiber	5.50	@	—
Kraft, No. 2.....	5.50	@	—

(F. o. b. Cars, Toronto)

News, per ton—			
Rolls (contract)...38.50		@	—
Sheets 45.50		@	—

Pulp

Ground wood.....32.00		@	—
Unbleached Sulphite.59.00		@	—
Book (Class 1).....71.00		@	—
Writing (Class 2)..72.00		@	—
Select (Class 3).....73.00		@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut...	2.50	@	—
Soft White.....	2.15	@	—
White Blk. News..	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.00	@	—
Light and Crumpled Book Stock.	.85	@	—
Ledgers and Writings	1.20	@	—
Manilas—			
New Manila Cut...	1.50	@	—
Printed Manilas...	.65	@	—
Kraft	1.00	@	1.70
News and Scrap—			
Strictly Overissue.	.65	@	—
Strictly Folded....	.60	@	—
No. 1 Mixed Paper..	.50	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09	@	.09½
Fancy Shirt Cuttings	.03½	@	.03¾

Index, Technical Section, Paper Trade Journal, Volume 105, July to December, 1937

Prepared by Clarence J. West, Chairman, Committee on Abstracts and Bibliography, TAPPI

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Modern Refractory Practice

Covering every phase of the subject of industrial furnace refractories, this publication is actually a practical service handbook, an up-to-date technical review, and a complete catalog combined in a single volume. While it follows the general lines of the first edition, published in 1929, the book has been completely rewritten, and increased in size from 180 to 296 pages.

Sixteen full-page furnace drawings have been prepared on the basis of current industrial practice in cooperation with engineers specializing in furnace design. These drawings show in detail the standard types of refractories used at every point, as well as alternate types used to meet special conditions of operation. A discussion of the particular problems encountered in the use of refractories in each type of furnace is also included.

An entire chapter is devoted to suggestions of a practical nature regarding the selection, care and use of refractories, including ordering and handling brick, bonding methods, the best ways to provide for thermal expansion, arch construction, design and placement of skewbacks, and factors affecting service life. Another new chapter, "Refractories and Their Properties," gives basic technical data on the composition, structure, and properties of refractories as affected by furnace temperatures, furnace gases and slags. A glossary and a selected list of minerals and rocks of significance to those concerned with refractories is unusually complete.

A new arrangement of formulas for calculating brickwork permits simple application by practical operating men, while at the same time offering a more fundamental approach for engineers who wish to use it. The tables showing combinations of brick required to turn circles call for much less interpolation than in the past as the diameters are given in one-inch intervales within the range of dimensions commonly employed. Tables for combinations of brick required to form arches of various spans and rises have been expanded and improved.

In recent years a number of new types and classes of refractories have been introduced; and the list of standard and special sizes available in the various types and classes has been considerably expanded. A complete review of all available sizes and shapes, illustrated by dimensional sketches, is a valuable feature of the volume.

The price of the book is $2.50, but it is offered without charge to users of refractories. For student use, the price to faculty members of universities and colleges, is $1.25 for single copies and $1.00 in lots of six or more.

MODERN REFRACTORY PRACTICE—Second Edition. Published by Harbison-Walker Refractories Company, Pittsburgh, Pa., 1937. 296 pages, 52 illustrations, 97 charts and tables, index.

New TAPPI Members

The Executive Committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

Rufus L. Baughn Jr., chemist pulp and paper Laboratory of the Industrial Committee of Savannah, Ga., was formerly Chemist for the International Vegetable Oil Company, Savannah.

Herbert L. Becher, chemist, Homosote Company, Trenton, N. J., is a graduate of the Technical University of Vienna, Austria and was formerly Chemist for Wall Paper Manufacturers Ltd., Sunberry-on-Thames, England.

Thomas E. Bell, district manager, Republic Flow Meters Company, Atlanta, Ga., is a 1925 graduate Mechanical Engineer of Georgia School of Technology.

G. S. Brazeau, manager, Everett, Wash. Mill, Pulp Division, Weyerhaeuser Timber Company has been transferred from associate to active membership in the Technical Association.

Earl B. Brookbank Jr., student, Institute of Paper Chemistry, Appleton, Wis., is a 1936 graduate of Lawrence College and has been employed by the Puget Sound Pulp and Timber Company, Anacortes, Wash., Weyerhaeuser Timber Company, Longview, Wash., and the Northern Paper Mills, Green Bay, Wis.

Albert W. S. Bull, chemist, Dominion Cellulose Ltd., Toronto, Ont., is a 1937 graduate in Chemical Engineering of the University of Toronto.

William Dohne, chemist, Champion Paper and Fibre Company, Canton, N. C., is a 1936 graduate of the New York State College of Forestry, Syracuse, N. Y., and was formerly an inspector for the Armstrong Cork Co., Fulton, N. Y.

Henry O. Ehrisman, sales engineer, The Foxboro Company, Foxboro, Mass., is a 1925 graduate of the Lowell Institute and was formerly employed by Holzer-Cabot Electrical Company, Hixon Electric Company, and the Atlantic Precision Co. of Boston.

Albert E. Fuller, plant manager, Pulp and Paper Laboratory of the Industrial Committee of Savannah, Ga., was formerly superintendent of the Orange Pulp and Paper Company, Orange, Texas, the Southern Kraft Company, Panama City, Fla., the Crown Williamette Paper Company, Floriston, Cal., and Foreman, Pacific Mills Ltd., Ocean Falls, B. C. Moises B. Garcia, superintendent, Papelera Moderna, Havana, Cuba, attended Havana University and was formerly Assistant Manager, Fernandez Castro y Cia, Papelera Cubana and Papelera Nacional, Havana, Cuba.

James H. Haley, president, J. H. Haley Sheet Metal Works, Chester, Pa.

James B. Hyde, Crown Zellerbach Paper Corporation, Camas, Wash., is a 1920 graduate in Mining Engineering Oregon State College and was formerly with the Anaconda Copper Mining Company, Anaconda, Mont., the Burroughs Adding Machine Company, Portland, Ore., and the U. S. Dept. of the Interior (geologist), Portland, Ore.

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Einer Walloe, Kraft Mill Superintendent, Pacific Mills Ltd., Ocean Falls, B. C., is a 1922 graduate of the University of Oslo, Norway, and was formerly employed by the Borregaard Paper Mills, Oslo, and the Howard Smith Paper Mills, Montreal, P. Q.

D. E. Stowe Made District Chairman

KALAMAZOO, Mich., January 24, 1938.—Douglas E. Stowe, purchasing agent of the Eddy Paper Company, Three Rivers, Mich., was elected District Chairman of the Fruit Belt Boy Scouts Council at the annual meeting held in that city.